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THE PUBLISHER'S PREFATORY

ALL books that are really worth while may be divided into four classes: first, books of *information;* second, books of *inspiration;* third, books of *entertainment;* fourth, books of *excitement.* By far the most important and practical of these classes is the first. The next in importance is the second; while rather trivial importance attaches to the third and fourth.

THE CIRCLE OF KNOWLEDGE preëminently belongs to the first; but it is also designed to be both inspiring and entertaining. In its methods of presentation and in its editorship it typifies the modern, progressive spirit. Behind it lies a quarter of a century of successful editorial experience in selecting, adapting, and translating from highly technical treatises into simple, clear, understandable language the essentials as well as important sidelights of human knowledge. Its purpose is to answer the why, who, what, when, where, how, of the vast majority of inquiring minds, both young and mature, and to stimulate them to still further questionings. For it is only through this self-questioning process of the active mind that individual progress is possible.

It is a fact of singular interest that every human being born into the world must independently go through practically the same educative processes from childhood to maturity. No matter how great the storehouse of the world's past knowledge, or how marvelous the multitude and wonder of new discoveries in every department of human endeavor, each individual must acquire and learn for himself the selfsame facts of nature, history, science, literature, human culture, and everyday needs.

In the present work special effort has been made to separate essentials from non-essentials; to distinguish human interest subjects of universal inportance from those of minor concern; to present living facts instead of dead verbiage; and to bring the whole within the understanding of the average reader, without regard to age, in an acceptable and interesting form. The use of graphic outlines and tables; maps, drawings, and diagrams; the pictured works of great painters, sculptors, and architects — all combine in vizualizing and vitalizing both the useful and cultural knowledge of past and present. Indeed it is difficult to conceive how the purely pictorial interest of the work could be surpassed, with its veritable picture galleries illustrating the pageant of man's progress; while the entire field of knowledge, from the measureless universe of space down to the simple fancy of a child, is sketched in its practical and essential outlines.

Never has there been greater demand for books of knowledge of the present type. The busy reader or consulter soon tires of the diffuse book or set of books of interminable words. He wants conciseness, directness, reasonable compass, reliability, with up-to-date treatment of topics of permanent usefulness. Above all he wants something that appeals to the eye, and, through the interest of its form and subject matter, stimulates thought and the imagination. While simplicity and clearness are undoubted virtues, great care has been exercised to prevent them from degenerating into those childish forms, all too frequent in certain books, that rob real knowledge of almost its entire value.

The best sources in the world of books have been laid under tribute in the preparation of this work, wisely supplemented by the wide experience of many eminent, practical, and progressive men and women — masters in their respective fields. It is earnestly hoped that this joint product will create for it a large sphere of usefulness and numerous satisfied readers.

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GENERAL OUTLINE OF CONTENTS

FIRST DIVISION: THE KINGDOMS OF NATURE

BOOK OF THE HEAVENS

THE UNIVERSE — THE SOLAR SYSTEM — SUN — PLANETS — MOON — CONSTELLATIONS — STARS — COMETS — METEORS — NEBULÆ — NEBULAR HYPOTHESIS — ECLIPSES — MYTHOLOGY OF THE CONSTELLATIONS — DICTIONARY OF SCIENTIFIC TERMS USED IN ASTRONOMY — STAR CHARTS AND MAPS.

*****Books of Reference about the Heavens.** — Campbell: *Handbook of Practical Astronomy.* Young: *Elementary Astronomy, Manual of Astronomy,* and *General Astronomy.* Ball: *Story of the Heavens.* Turner: *Modern Astronomy.* Newcomb: *Popular Astronomy.* Todd: *A New Astronomy.* Gregory: *Vault of Heaven.*

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OUR EARTH: ITS STRUCTURE AND SURFACE — GEOLOGICAL VIEW OF THE GROWTH OF THE EARTH — LAND FORMS OF THE WORLD — DISTRIBUTION OF LAND AND WATER — THE CONTINENTS — ISLANDS — MOUNTAINS — WATERS OF THE EARTH — FORMS OF WATER — RIVERS — WATERFALLS AND RAPIDS — LAKES — OCEANS — VOLCANOES — GEYSERS — ATMOSPHERE, CLIMATE, AND WEATHER — WINDS — CLOUDS — ATMOSPHERIC VAPOR, (DEW, MIST, FOG, RAIN, HAIL, SNOW) — GLACIERS — ICEBERGS — DESERTS — NATURAL FORCES — MINERAL PRODUCTS — PRONOUNCING DICTIONARY OF SCIENTIFIC TERMS — MAPS AND CHARTS.

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BOOK OF THE PLANT KINGDOM

REALMS OF LIFE UPON THE EARTH — CHIEF DIVISIONS OF THE PLANT KINGDOM: (1) CEREALS, GRASSES AND FORAGE PLANTS; (2) KITCHEN VEGETABLES; (3) THE FRUIT TREES; (4) FRUIT-BEARING SHRUBS AND PLANTS; (5) FLOWERS AND OTHER ORNAMENTAL PLANTS; (6) WILD FLOWERS AND FLOWERLESS PLANTS; (7) TREES OF THE FOREST; (8) FIBER AND COMMERCIAL PLANTS; (9) POISONOUS PLANTS; (10) SOME WONDERS OF PLANT LIFE — BOTANICAL CLASSIFICATION OF PLANTS — SCIENTIFIC TERMS USED IN BOTANY, CLASSIFIED AND ILLUSTRATED — MAP OF THE PLANT KINGDOM.

*****Books of Reference about the Vegetable Kingdom.** — Gray: *New Manual of Botany.* Bessey: *Synopsis of Plant Phyla.* Small: *Flora of the Southeastern United States.* Coulter and Nelson: *New Manual of the Botany of the Central Rocky Mountains.* Gray: *Synoptical Flora of North America.* Britton: *Manual of the Flora of the Northern States and Canada.* Strasburger, Noll, Schenck and Karsten: *Textbook of Botany.* Pfeffer: *Physiology of Plants.* Ward: *Disease in Plants.* Schimper: *Plant Geography.* Campbell: *Evolution of Plants.* Green: *Landmarks of Botanical History.* Sach: *History of Botany,* 1530–1860. Green: *History of Botany,* 1860–1900. Baker: *Elementary Lessons in Botanical Geography.*

BOOK OF THE ANIMAL KINGDOM

SCIENTIFIC CLASSIFICATION OF ANIMALS — TABULAR VIEW OF REPRESENTATIVE ANIMAL TYPES — ANIMALS IN CLASSIFIED GROUPS:

I. Wild Animals:

(1) THE MAMMALS: (*a*) THE MONKEY TRIBE; (*b*) ANIMALS OF PREY; (*c*) GNAWING ANIMALS; (*d*) HOOFED ANIMALS; (*e*) TOOTHLESS ANIMALS; (*f*) THICK-SKINNED ANIMALS; (*g*) POUCHED ANIMALS; (*h*) FLYING ANIMALS; (*i*) THE SEALS; (*j*) THE WHALES.

(2) THE BIRDS: (*a*) BIRDS OF PREY; (*b*) CLIMBING BIRDS; (*c*) SINGING BIRDS; (*d*) WADING BIRDS; (*e*) SWIMMING BIRDS; (*f*) RUNNING BIRDS; (*g*) GAME BIRDS.

(3) THE REPTILES: Lizards — Chameleons — Snakes — Crocodiles — Tortoises — Turtles.
(4) AMPHIBIANS: Frogs — Toads — Salamanders.
(5) THE FISHES: (*a*) Bony Fishes; (*b*) Cartilaginous Fishes; (*c*) Armored Fishes; (*d*) Lung-fishes.
(6) THE MOLLUSCS: Snails — Cuttlefish — Squids — Octopus — Tusk Shells — Bivalves — Oysters.
(7) JOINTED-LIMBED ANIMALS: Crabs — Lobsters — Scorpions — Spiders — Insects — Grasshoppers.
(8) BUTTERFLIES AND MOTHS: Straight-Winged Insects — Ants and Bees — Flies.
(9) STARFISHES AND SEA-URCHINS.
(10) SIMPLEST FORMS OF LIFE.

II. Domesticated Animals:

(1) DOMESTICATED MAMMALS: Alpaca — Ass — Camel — Cat — Cattle — Dog — Elephant — Gayal — Goat — Guinea Pig — Horse — Llama — Rabbit — Reindeer — Sheep — Swine — Yak — Zebu.
(2) DOMESTICATED BIRDS: Canary — Chickens or Fowls — Guinea — Goose — Ostrich — Parrot — Peacock — Pigeon — Swan — Turkey.
(3) DOMESTICATED INSECTS: Bee — Cochineal — Silkworm Moth.

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*****Books of Reference about Animals.**—Rolleston: *Forms of Animal Life.* Huxley: *Anatomy of Invertebrated Animals and Anatomy of Vertebrated Animals.* Lankester: *Treatise on Zoölogy.* Parker and Haswell: *Text-Book of Zoölogy.* Kingsley: *The Standard Natural History* and *Elements of Comparative Zoölogy.* Newton: *A Dictionary of Birds.* Headley: *The Structure and Life of Birds.* Wilson: *American Ornithology.* Audubon: *Ornithological Biography.* Coues: *Key to North American Birds.* Chapman: *Handbook of Birds of East North America.* Bendire: *Life Histories of North American Birds.* Comstock: *Insect Life.* Packard: *Text-Book of Entomology* and *Guide to Study of Insects.* Howard: *The Insect Book.* Beddard: *Text-Book of Zoögeography.* A. Heilprin: *The Geographical and Geological Distribution of Animals.*

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BOOK OF RACES AND PEOPLES

I. MAN AND THE HUMAN FAMILY — HOW MAN DIFFERS FROM OTHER ANIMALS — QUESTIONS OF MAN'S ORIGIN — HIS PRIMEVAL HOME — OLDEST EXTANT REMAINS OF THE HUMAN RACE — MAN'S ADVANCEMENT IN THE PRE-HISTORIC AGES — CHART SHOWING DEVELOPMENT OF THE RACE THROUGH THE AGES: (1) Dawn; Stone Age; (2) Old Stone Age; (3) New Stone Age; (4) Bronze Age; (5) Early Iron Age; (6) Late Iron Age; (7) Age of Letters.

II. HOW THE RACES ARE CLASSIFIED — CHART OF PHYSICAL AND MENTAL RACE CHARACTERISTICS — GEOGRAPHICAL DISTRIBUTION OF THE RACES OF MANKIND — DICTIONARY OF THE HISTORICAL RACE GROUPS — COMPARATIVE CLASSIFICATION OF RACES AND PEOPLES.

*****Books of Reference about Man.**— Prichard: *Researches into the Physical History of Mankind.* Latham: *Natural History of the Varieties of Man.* Waitz: *Anthropology.* Darwin: *The Descent of Man.* Huxley: *Essays* and *Man's Place in Nature.* Quatrefages: *Classification des Races Humaines.* Peschel: *The Races of Man.* Tylor: *Anthropology.* Lubbock: *Prehistoric Times.* Ratzel: *History of Mankind.* Keane: *Ethnology and Man. Past and Present.* Deniker: *The Races of Man.* Hutchinson: *The Living Races of Mankind.*

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I. Extinct Nations of the Past.

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ATLASES.—Bartholomew: *Atlas*. Rand-McNally: *Atlas; Century Dictionary and Atlas*. Johnson: *Historical Atlas*. McClure: *Historical Church Atlas*.

GAZETTEERS.—Blackie: *Imperial Gazetteer*. Longman: *Gazetteer of the World*. Lippincott: *Gazetteer*. Baedecker: *Guides*.

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ITS STRUCTURE — ORGANIZATION INTO SYSTEMS — FUNCTIONS — SPECIAL SENSES — NERVOUS SYSTEM — PERSONAL HYGIENE — PREVENTION OF DISEASE — INTERDEPENDENCE OF BODY AND MIND — EUGENICS — ILLUSTRATIONS AND CHARTS

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LIST OF ILLUSTRATIONS

Color Plates

Marvels of the Earth's Rotation and Forces
Proud Color Beauties of the Land of Flowers
Three Celebrated Pictures of Animal Favorites
Washington, America's City Beautiful
Architectural Glories of Famous Lands
Famous Historical Pictures by Oriental Artists
Tennyson's Beautiful "Lady of Shalott"
"Open Sesame!" Ali Baba at the Cave.
Picture Diagrams of Eye and Ear
The Fiery Furnace that Purifies Bessemer Steel
"The Ides of March"
Famous Masterpieces by Famous Painters

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Color Diagram Showing the Ocean Beds
Diagram of Orbits of the Planets
Picture Diagram of the Moon's Phases
Star Charts of the Chief Constellations
Maps of the Chief Constellations
Chart of the Milky Way
Diagrams Showing Formation of Eclipses
Diagram Showing a Bisection of the Earth
Chart Showing the Geological Growth of the Earth
Geological Map of the United States
Maps Showing Relative Size of Islands of the World
Diagram of the World's Famous Rivers and Mountains
Maps Showing Relative Size of Lakes
Diagrams Explaining the Seasons, Day and Night
Pictorial Chart of Cloud Formations
Map Showing Distribution of Plant Life
Map Showing Range of Animal Life
16 Maps in Color Showing the Progress of Geographical Discovery
2 Picture Maps Presenting a Panoramic View of Paris
5 Picture Maps Giving a Panorama of the River Rhine
Picture Diagram Showing Parts of a Locomotive
Picture Diagram of Submarine
Picture Diagram Explaining Wireless Telegraphy
Picture Diagram Explaining an Electric Battery
Picture Diagram Showing How Electricity is Generated
Picture Diagram Explaining Radioactivity
Map of Panama Canal and Connections

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THE UNIVERSE: ITS MAGNITUDE AND MEANING

THE SOLAR SYSTEM: Sun, Planets, Moon, Constellations, Stars, Comets, Meteors, Nebulæ, and other Wonders of the Skies

ORIGIN OF THE WORLDS: THE NEBULAR HYPOTHESIS

ECLIPSES: CAUSES AND EXPLANATION

MYTHOLOGY OF THE CONSTELLATIONS

DICTIONARY OF SCIENTIFIC TERMS

STAR CHARTS AND MAPS

NUMEROUS ILLUSTRATIONS AND TABLES

1. Crowded group of stars seen in the constellation Hercules.

2. Beautiful circular group of stars in Aquarius. Very brilliant toward the center.

3-4. Fan-shaped groups of stars, frequently to be observed.

5. Round nebula of Ursa Major.

6. A fine star in Gemini with a great, oval atmosphere.

7. Star in Leo Major in the middle of nebula with very pointed ends.

8-9. Nebulæ with luminous trains like the tail of a comet.

10. Two stars in Canes Venatici joined by elliptical nebula.

11. Elliptical nebula in Sagittarius with a star in each of the foci.

12-13. Round nebula in Auriga with three stars in a triangle.

14. Great nebula in Andromeda.

15. Comet of 1819, of remarkable size.

16-17. Great comet of 1811.

18. Surface of the planet Mars, showing the supposed continents and seas.

19. Disk of the great planet Jupiter with its dark streaks and masses.

20. The wonderful planet Saturn with its remarkable rings.

Explanation of Figures in Diagram

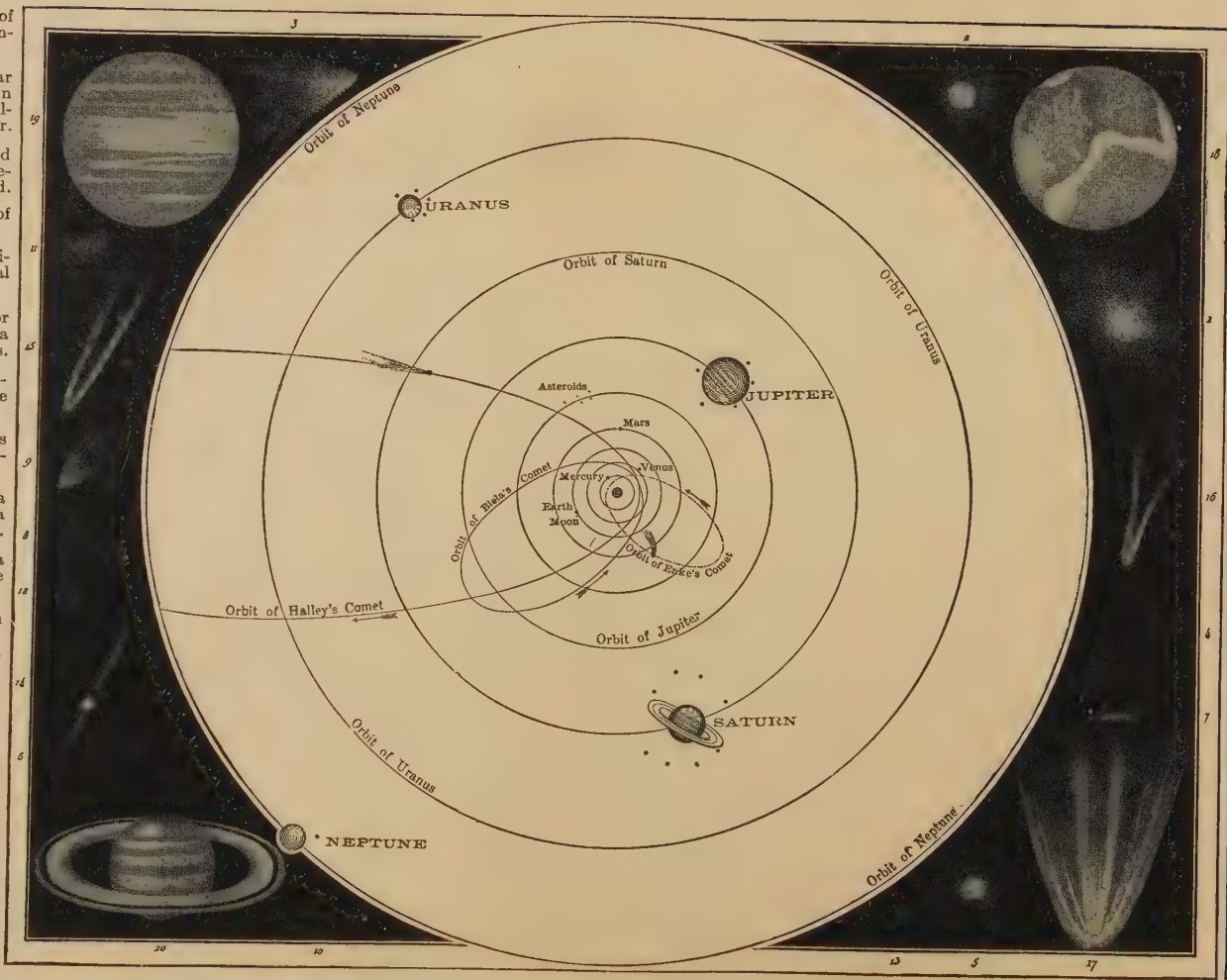


DIAGRAM SHOWING RELATIVE ORBITS OF THE PLANETS AROUND THE SUN

Rate at which the Planets Travel

BOOK OF THE HEAVENS

THE UNIVERSE — THE SOLAR SYSTEM — PLANETS — SUN — MOON — CONSTELLATIONS — STARS — COMETS — METEORS — NEBULÆ — NEBULAR HYPOTHESIS — ECLIPSES—MYTHOLOGY OF THE CONSTELLATIONS—DICTIONARY OF SCIENTIFIC TERMS USED IN ASTRONOMY.

HOW THE PLANETS WOULD APPEAR IF GROUPED IN SPACE

In the above picture we have represented the planets of the Solar System as we should see them from the earth if the human eye could grasp a space of such immensity. The spectator is supposed to be standing on the earth, and the moon is in the foreground, 240,000 miles away. The planets are in their order outward from the sun, and vary in distance from 40,000,000 miles, in the case of Mars, to 2,700,000,000 miles in the case of Neptune. From the bottom upward, the planets are Mercury, Venus, Mars, Jupiter, Saturn and its rings, Uranus and Neptune.

THE WORLDS IN THE SKIES

THE EARTH upon which we live is only one of many worlds that whirl through space. If we are to understand our own world, we must first learn something about the worlds in the skies. These bodies are arranged in groups, or systems, sweeping through circuits that baffle measurement; and such is the magnitude of the boundless space they occupy that our entire solar system is only a point in comparison. To this vast expanse of worlds, and systems and space we give the general name *Universe.*

THE SOLAR SYSTEM AND ITS MEMBERS

First in importance to us in this immense space filled with stars is what astronomers call the Solar System, so-called because the sun is its center. It contains the planets, eight in number, of which our earth is one. They have been named after the ancient deities; the two interior ones, Mercury and Venus, and the exterior ones, Mars, Jupiter, Saturn, Uranus, and Neptune; the first three being smaller than our earth, and the remainder a great deal larger.

Mercury and Venus are known to be *interior* planets, that is, planets between us and the sun, because they appear to swing on either side of the sun. Mercury very seldom leaves the sun sufficiently to rise so early before the sun, or set so late after him, as to be visible. Venus, how-

ever, gets so far away as to be seen long after sunset or before sunrise, and is called the Evening or Morning star, accordingly.

Besides the planets there are other members of the system, namely, *comets* and *falling stars*, which will be mentioned again more fully hereafter. All these bodies form a sort of family, having the sun for their head. The illustrations and drawings on separate pages give a view of the entire system.

Comparative Size. The size of the planets, in general, increases with their distance from the sun. The four composing the first group are all comparatively small, the earth being the largest. Those of the second group are all of great size. Jupiter, the largest, is not less than 1,390 times as large as the earth; but as it is much less dense, the amount of matter it contains is only a trifle more than 337 times that of the earth. All the planets together equal but one seven-hundredth part of the mass of the sun.

The Satellites, except our moon, and the two satellites of Mars, belong wholly to the second group of planets. Jupiter has eight; Saturn eight and several revolving rings; Uranus has four, and possibly more; while Neptune, so far as known with certainty, has but one.

Movements within the Solar System

Rotary Motion. The sun, all the primary planets, and their satellites, as far as known, rotate from west to east. Each rotation constitutes a day for the rotating body. The central line of rotary motion is called the axis of rotation, and the extremities of the axis are called the Poles.

Revolution Around the Sun. All the primary planets and asteroids revolve around the sun in the direction of their rotation, that is from west to east; and the planes of the orbits in which they revolve coincide very nearly with the plane of the sun's equator. One revolution around the sun constitutes the year of a planet.

All the satellites, except those of Uranus and perhaps Neptune, also revolve from west to east.

Most of the comets revolve around the sun in very irregular and elongated orbits, only a few having their entire orbit within the planetary system. Some so move that after having entered our system and made their circuit around the sun, they seem to leave it, never to return.

Since the orbits of the planets are in most cases not far removed from the plane of the ecliptic, they are to be seen in a comparatively narrow belt of the heavens called,

The Zodiac. The belt of the sky which occupies 8° on each side of the ecliptic is called the Zodiac, and it is within this belt that the moon and the chief planets confine their movements, as none of their orbits is inclined to that of the earth by more than 8°. The Zodiac, which circles the celestial sphere, is divided into twelve signs each of which occupies 30°, and roughly coincides

The Egyptian Planisphere containing the Zodiacal signs, with the Southern constellations, according to Kircher.

The Egyptian Planisphere containing the Zodiacal signs, with the Northern constellations, according to Kircher.

with a constellation. The following lists give the signs of the Zodiac, with the seasons in which the sun passes through each of them:

Spring: Aries the Ram; Taurus the Bull; Gemini the Twins.

Summer: Cancer the Crab; Leo the Lion; Virgo the Virgin.

Autumn: Libra the Balance; Scorpio the Scorpion; Sagittarius the Archer.

Winter: Capricornus the Goat; Aquarius the Water-bearer; Pisces the Fishes.

Owing to the precession of the equinoxes, the signs of the Zodiac do not now correspond with the constellations of which they bear the names. Thus the sign Aries, in which the sun is seen on March 21st as it passes the vernal equinox, with which the solar year begins, is now in the constellation of Pisces, and in the course of the next 23,000 years it will move steadily backward through the constellations until it returns to the Ram, where it stood when its name was first given to it.

KEPLER'S CELEBRATED LAWS OF PLANETARY MOVEMENTS

The laws under which the planets move were discovered through the genius of John Kepler, and are known as Kepler's Laws of Planetary Motion. Kepler derived these laws from observation only, but Newton first explained them by showing that they were the necessary consequences of the laws of motion and the law of universal gravitation.

DIAGRAMS ILLUSTRATING KEPLER'S FIRST TWO LAWS OF PLANETARY MOTION

The diagram on the left illustrates the ellipse, and explains the first and second laws. The picture-diagram on the right illustrates the second law, which is that, as the planet moves round the run, its radius vector describes equal areas in equal times. That is to say, a planet moves from A to B in the same time as it takes to move from C to D.

KEPLER'S FIRST LAW states: "The earth and the other planets revolve in ellipses with the sun in one focus."

KEPLER'S SECOND LAW states: "The radius vector of each planet moves over equal areas in equal times."

KEPLER'S THIRD LAW states: "The squares of the periodic times of the planets are in proportion to the cubes of their mean distances from the sun."

These laws cannot be fully understood without some acquaintance with mathematics. They may, however, be briefly explained for the comprehension of the non-mathematical reader. The figure in the diagram is an ellipse—what is known in popular language as an oval—which is symmetrical about the line AB, known as its major axis. It has two foci, S and S_1. The fundamental law of the ellipse is that if we take any point P on it, and join this point by a straight line to the two foci, then the sum of these two lines SP and S_1P is always the same—$SP+S_1P=C$.

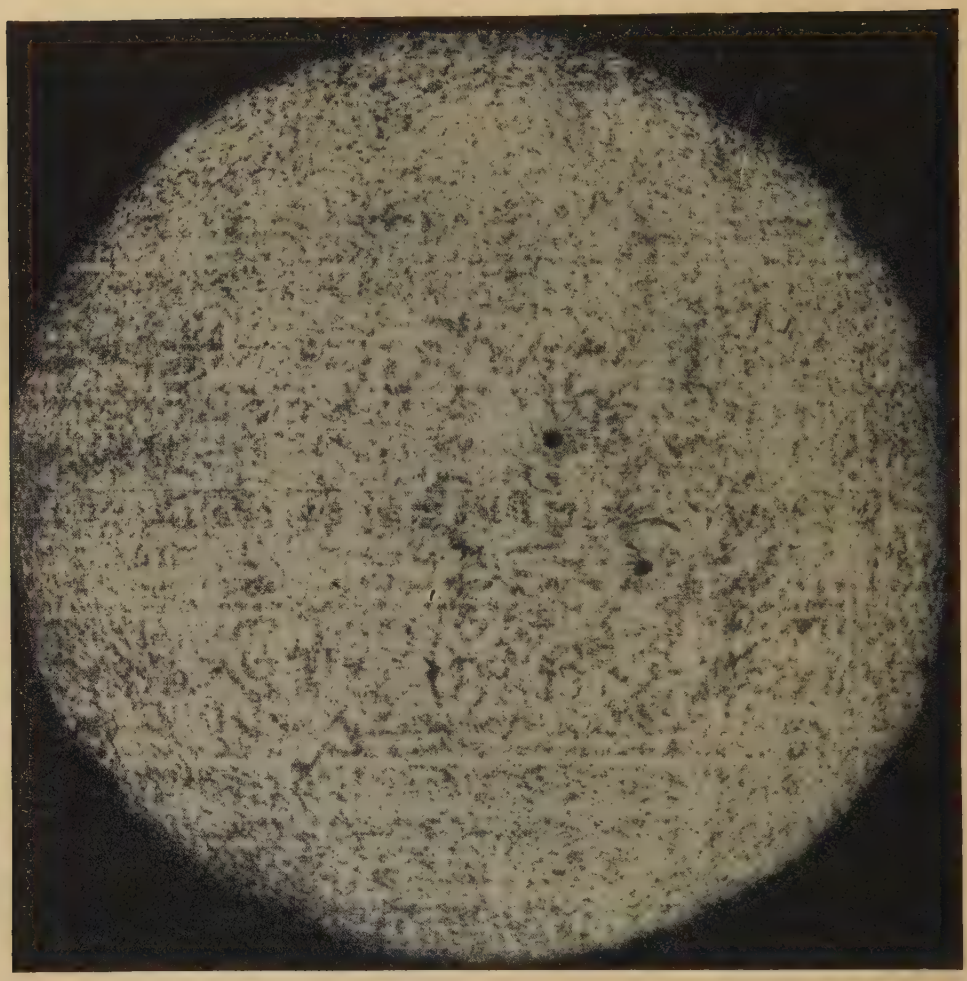
The second law is rather less easy to understand. The *radius vector* is the line joining the sun to the planet at any moment; if we suppose the sun to be at the focus S, and P to be the planet, the radius vector at various positions of the planet will be represented by the lines SP, SP_1, SP_2, and so on. If the positions P, P_1, P_2, and so on, represent those which the planet occupies after equal periods of time—say, once a month—then the sectors of the ellipse bounded by each pair of lines, SP and SP_1, SP_1 and SP_2, will be equal. If a planet were to move in a circle round the sun, it is obvious that this law would imply that it moved with a uniform speed; but since the curvature of the ellipse varies in every part of its course, so must the speed of the planet, in order that its radius vector may describe equal areas in equal times. The planet will, in fact, be moving faster when it is near the sun, as at P, than when it is far off from the sun, as at P_2.

The third law shows that there is a definite numerical relation between the motions of all the planets, and that the time which each of them takes to complete its orbit depends upon its distance from the sun.

On his discovery of his third law Kepler had written: "The book is written to be read either now or by posterity—I care not which; it may well wait a century for a reader, as God has waited six thousand years for an observer." Twelve years after his death, on Christmas Day, 1642, near Grantham, England, the predestined "reader" was born. The inner meaning of Kepler's three laws was brought to light by Isaac Newton.

THE GIGANTIC SUN AND HIS FUNCTION IN THE SOLAR SYSTEM

The great luminary which warms, lights, and rules the solar system is, like the majority of its fellow stars, a gigantic bubble. In other words, it is a globe of



A PHOTOGRAPH OF THE SUN, SHOWING THE CLOUDS OF FIERY VAPOR WHICH SURROUND IT

glowing gas, which is nowhere solid, though the immense pressure which must exist in its interior probably causes this gas to assume there a density greater than that of any solid which we know.

Dimensions of the Sun. The sun appears to human vision as a brilliant globe of a little more than half a degree in diameter. It is about the same apparent size as the moon, since the size of the sun is to that of the moon very nearly in the same proportion as their relative distances from the earth. In reality, however, the sun is a gigantic orb, so huge that if the earth were at its center the whole orbit of the moon would lie well within its circumference. The diameter of the sun is about 866,500 miles.

The mass of the sun is about 332,000 times that of the earth, but its specific gravity is only about a quarter that of the earth, 1.41, if that of water be taken as unity. The mean distance of the sun from the earth is about 92,800,000 miles; but, as the earth's orbit is not circular but elliptic, this distances varies by about 3,000,000 miles, being smallest in January and greatest in July.

The Physical Condition of the sun is very different from that of the earth, though we know it is composed of very similar materials. The white-hot surface that we see, called the *photosphere*, is believed to be largely a shell of highly heated metallic vapors surrounding the unseen mass beneath. Dark spaces seen in the photosphere are known as *sun-*

This diagram illustrates the theory that sun-spots are formed by fragments struck from Saturn's rings (which are in themselves nothing more than a great meteoric swarm) by the swarm of meteors known as the Leonids, which fragments fall into the solar furnace at a speed of four hundred miles a second.

spots, and these are often surrounded by brighter patches, termed *faculæ*. Above the photosphere a shallow envelope of gases, rising here and there into huge prominences, and known as the *chromosphere*, is seen in red tints when the sun is totally eclipsed. Beyond the chromosphere, there is also seen, at the same time, a faint but far more extensive envelope called the *corona*.

The sun's rays supply light and heat not only to the earth, but also to the

other planets which revolve round it. Its attraction confines these planets in their orbits and controls their motions.

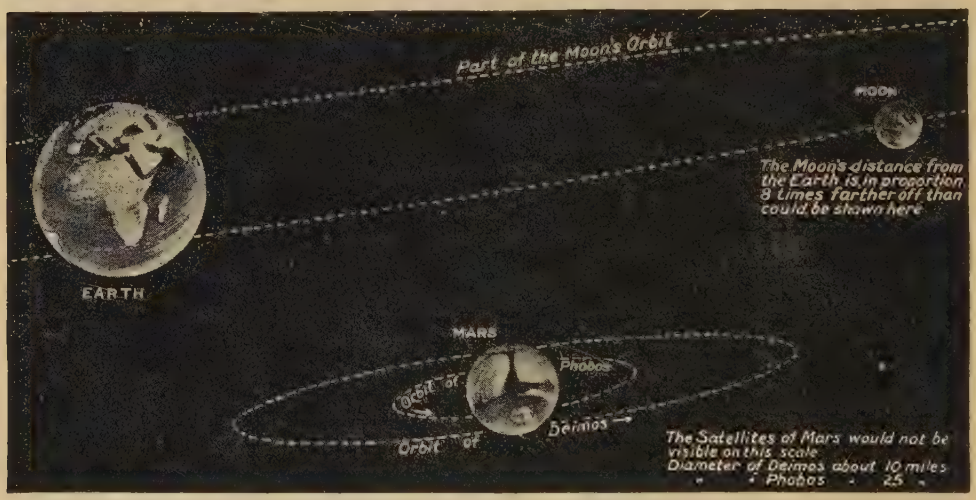
THE MOON—THE EARTH'S ONLY SATELLITE

THE MOON, the satellite of the earth, is the nearest to us of all the heavenly bodies, being at a mean distance of 240,000 miles. Its diameter is 2,153 miles and, its density being little more than half that of the earth, the force of gravity at its surface is very much less than that at the surface of the earth. A body which weighs a pound here would only weigh about two and one-half ounces if taken to the moon.

THE MOON'S ORBIT. Her path is approximately an ellipse with the earth in one focus. Its apparent motion in the sky is from west to east, but she moves much faster than the sun, taking about twenty-seven days eight hours to travel all round the earth. The time between two successive new moons (synodic period or lunation) is twenty-nine and one-half days. The reason of the difference is that the sun moves slowly in his annual course through the stars in the same direction as the moon, which therefore in its revolution round the earth has to overtake him when it returns. The moon rotates on its axis in the same time as it performs a revolution in its orbit; hence the same half is always turned toward us.

When the moon in her orbit lies between the sun and the earth, she is said to be in *conjunction* with the sun; when the earth is between the moon and the sun, the moon is said to be in *opposition* to the sun. At either of the two points midway from conjunction and opposition, i. e. 90° from conjunction or opposition, the moon is said to be in *quadrature*.

THE PHASES OF THE MOON. Except at opposition—i. e. when the earth is between the moon and sun—the whole of the moon's disc does not appear bright to us, and the amount of the bright surface seen by us is found to depend on the relative positions of moon and sun. Half of the moon is always illuminated by the sun; but when it is in conjunction between the earth and sun the whole of the bright surface is on the side away from us; so that the moon is invisible. As it moves farther from the line joining earth and sun, a small portion of the bright side comes into view as a narrow crescent. This increases till half the disc is illuminated, when the lines joining earth and moon and earth and sun are at right angles. From this time the moon loses its crescent shape and becomes convex on both sides, or gibbous (Lat. *gibbus*, a hump)—the maximum brightness, or full moon, occurring when sun and moon are on opposite sides of the



THE SYSTEM OF MARS AND ITS MOONS CONTRASTED WITH THAT OF THE EARTH AND MOON

In this diagram the markings on the earth and Mars are to scale, the orbits of the planets are seen in perspective and the measurements are according to Prof. Percival Lowell.

earth. After this the moon becomes gibbous, then crescent, and vanishes before the time of new moon.

It is worthy of note that the moon is higher in the heavens and longer above the horizon in the winter than in summer. This is owing to the plane of its orbit being at night high towards the south in winter and low in summer, as is the ecliptic. The moon's orbit, like that of other planets, is elliptical, but irregular. When nearest to the earth, she is said to be in *perigee;* when at the greatest distance, in *apogee.*

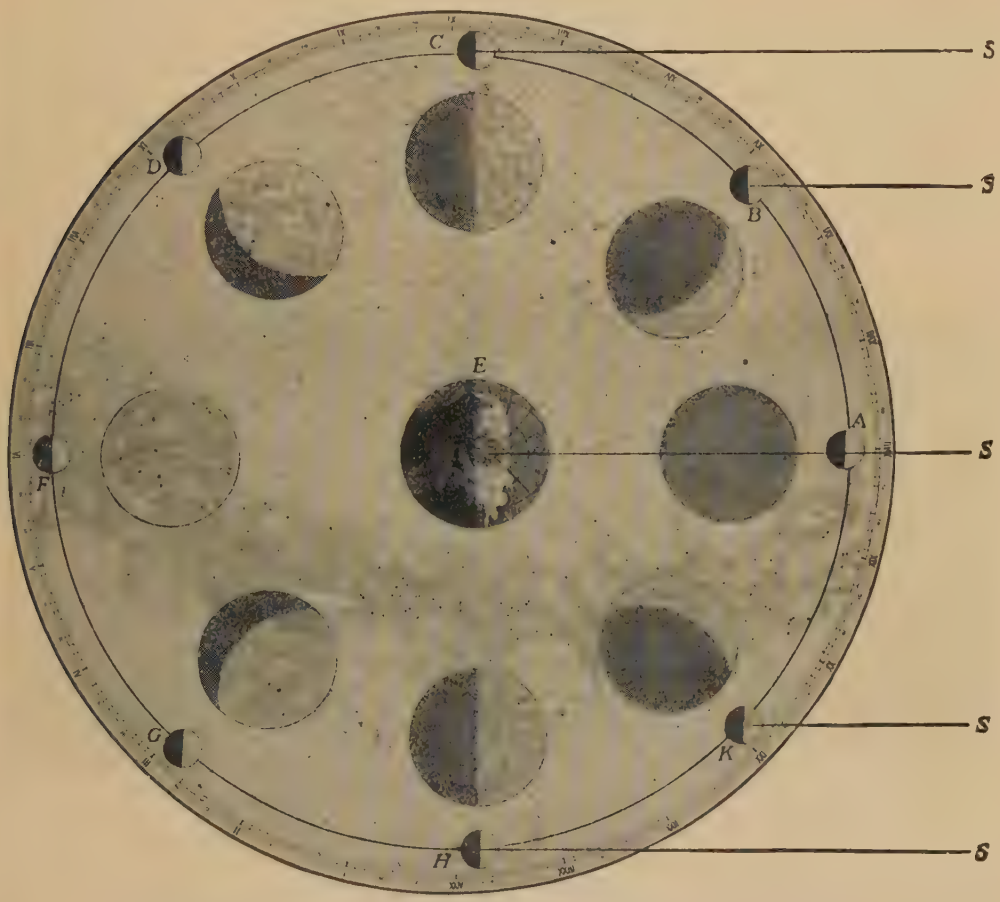


DIAGRAM SHOWING HOW THE MOON'S PHASES ARE CAUSED

In the above diagram, the earth is in the center, and the circle ACFH the orbit of the moon. Since the inclination of the plane of the moon's orbit to the plane of the ecliptic is only a few degrees, we may neglect it in this case, and suppose the two planes to coincide. Let the sun lie in the direction ES. Since the distance of the sun from the earth is about three hundred and eighty-seven times the distance of the moon from the earth, the lines ES, HS, BS, etc., drawn to the sun from different points of the moon's orbit, may be considered to be sensibly parallel. Let us first suppose the moon to be in conjunction with the sun at the point A. Here only the dark portion of the moon is turned towards the earth, and the moon is therefore invisible. This is called new moon. As the moon moves on towards B, the enlightened part begins to be visible, and when it reaches C, half the enlightened part is visible, and the moon is at its first quarter. When the moon is at F, in opposition to the sun, all the illuminated part is turned towards the earth, and the moon is full. The moon wanes after leaving F, passes through its last quarter at H, and finally becomes again invisible at A.

Surface of the Moon. The moon is an opaque, cold globe, covered with mountains, extinct volcanoes, and plains. She has neither water nor atmosphere, and always presents the same surface to the earth in consequence of rotating on her axis in the same time as she revolves round the earth. Moonlight is only reflected sunlight, the illuminated hemisphere being always turned towards the sun.

The face of the moon has been studied and mapped on a large scale. Its chief features are three in number: (1) the

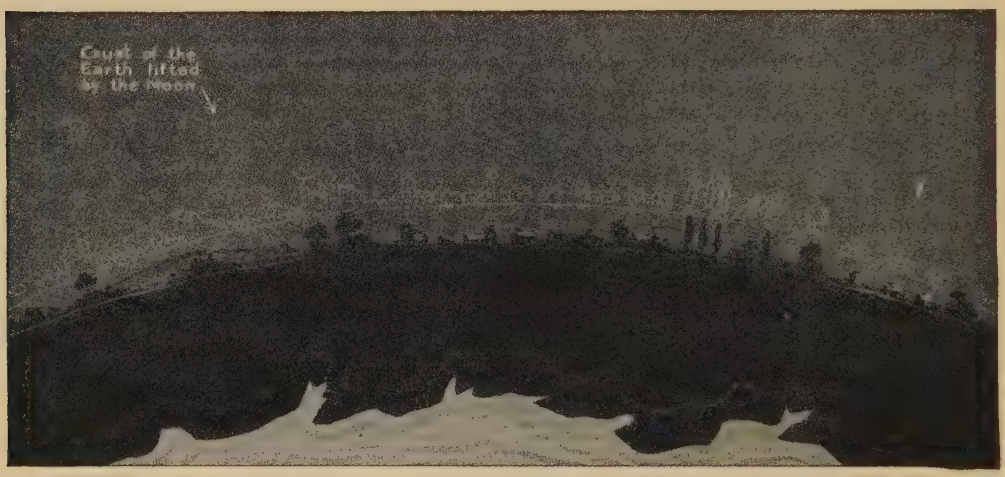
numerous *volcanic craters*, such as Tycho and Copernicus, which are mostly named after distinguished men of science; (2) the wide, dark plains which are known as *seas*, because they were formerly thought to consist of water; (3) the curious systems of *bright streaks*, which radiate from many of these craters, of which the most remarkable extend in all directions from the great crater Tycho, near the moon's south pole, and are conspicuous even to the naked eye at the time of full moon.

THE MOON AND THE TIDES. The moon has long been known to have an effect upon the tides, and may perhaps influence the winds. It is of enormous importance to navigators for the determination of longitude, and hence its movements have been investigated with the greatest care and precision.

THE PLANET MARS. Nearest to the earth, with the single exception of Venus, resembles the earth more closely than any other of the planets, and is most favorably situated for our observation of all the heavenly bodies, except the moon. It is a globe rather more than half the size of the earth. When Mars comes nearest to the earth its distance from us is about 35,000,000 miles. At these favorable moments its brightness is about equal to Jupiter, and only surpassed by that of Venus. Mars has a very pronounced red color, which is supposed to be due to the prevalence of a rock like our red sandstone on its surface, or possibly to the color of its vegetation.

Its density is much less—about three-quarters that of the earth; so a pound weight placed on its surface would not weigh much more than six ounces, and a ponderous elephant would, if there, be able to jump about with the agility of a fawn.

The heat and light which Mars receives from the sun, therefore, vary enormously, and so cause a difference in the lengths of winter and summer in his north and south hemispheres, the seasons in the north hemisphere being far more temperate than those in the south. Viewed with the telescope, large dark green spots are seen, the rest of the surface being of a ruddy tint, except at the two poles, where two white spots are observed and considered to be due to large masses of snow and ice. It has been supposed that the greenish spots are oceans, and the ruddy parts land. The spectroscope has shown that watery vapor is present in Mars' atmosphere, and appearances like huge rain-clouds sometimes obscure a part of the planet for a considerable period. Physical processes seem to go on there much the same as on our planet; hence many believe that Mars is inhabited and forms, in fact, a miniature picture of the earth.



HOW THE MOON FORMS "TIDES" IN THE CRUST OF THE EARTH

By reason of its power of attraction, it is well recognized that the Moon exercises a greater influence on the side of the earth which is nearest to it. In consequence the earth is subject to a stress or pull that tends to lengthen it out toward the moon, and then to recede as the earth turns away on its axis.

JUPITER. By far the largest of the planets is second in brilliancy to Venus, unlike which, however, it is a "superior" planet, having its orbit outside that of the earth. It is about five times as brilliant as Sirius, the brightest of the fixed stars.

The planet is a beautiful object when viewed with a telescope; it is probable that the markings are entirely due to its atmosphere, and that the actual surface of the planet is rarely visible. Jupiter has hardly yet cooled from the condition of incandescence, and it is only slightly solidified. It possesses eight satellites, four of which were discovered by Galileo when he applied the telescope first to the investigation of the heavens. By means of these satellites the first observations of the velocity of light were made. A fifth was discovered in 1892 at the Lick Observatory.

SATURN was recognized as a planet by the ancients, and was the outside member of the solar system as known by them. His diameters at the equator and poles differ considerably, the protuberance at the equator giving him there a diameter of 74,000 miles, while at the poles it is only 68,000. In size Saturn is the largest of the planets except Jupiter, being in fact seven hundred times larger than our earth, but his density is so small that he would be able to float on water far more easily than an iceberg. From this it follows that he cannot consist of solid or liquid matter, and in fact we can only view a mass of clouds intensely heated within, the whole being probably a planet in the early stage of development—younger even than Jupiter.

The most remarkable characteristic of Saturn, which makes him an object of such interest in the sky, is his possession of a luminous ring. The ring is only luminous on account of its reflection of the sun's light; hence is invisible to us when, for instance, we are endeavoring to look at the ring from below while the sun is shining above. It also sometimes happens that the plane of the rings passes through the sun or through the center of the earth, in which case only the thin edge of the rings can be seen. The ring is divided into two parts, the inner being the wider, while another faint division appears to divide the outer part into two smaller rings. In 1850 another ring was discovered; this is quite different from the outer rings, being dark, and generally known as the dusky ring of Saturn. The outer ones, though far from solid, can receive a shadow of Saturn, and themselves cast one on his disc. The rings are not continuous masses of matter, but consist of countless myriads of tiny satellites, so close together that to the observer they appear as one body. The planet has eight satellites which seldom pass behind or in front of the planet's disc, and therefore are not objects of great interest.

URANUS is the next planet beyond Saturn. His mass is about fifteen times as much as that of the earth, an amount which makes him more than outweigh Mercury, Venus, the Earth, and Mars combined. All astronomers do not agree in their estimation of these numbers. Uranus being too far away for measurements to be more than approximate. Gravity on his surface is only three-quarters of what it is here. Uranus has four satellites, and possibly faint rings like those which encircle Saturn.

NEPTUNE is farthest from the sun, the distance between the two bodies being about 2,750,000,000 miles. At this immense distance it will, according to Kepler's laws, take a long time to travel once around its orbit, and this time has been found to be one hundred and sixty-five of our years. Although it is ninety-seven times as large as the earth, yet, on account of its enormous distance from us it can only just be seen, even with a powerful telescope. Neptune possesses one satellite, which moves around the planet in rather less than six days.

MERCURY is the smallest planet, except the planetoids, in the solar system, and the one nearest the sun. It is never seen for more than two hours before sunrise or after sunset, and is not always visible then; but when it does appear, it is extremely brilliant. Even when it is most distant the sun appears four and a half times as big to it as it does to us, and when the two are at their nearest, this small planet gets ten times as much light and heat as we do. It is, however, so small and difficult to observe, that comparatively little is known of it.

VENUS appears to us as the most brilliant of all the planets, sometimes

in our latitude, though not all these are visible at the same time, many of them being below the horizon, while others are elevated in the sky at different times and seasons.

THE MAGNITUDES AND GROUPING OF THE STARS

In beginning our study of the stars, let us put ourselves in the position of the earliest observers. Let us first, like them, watch the stars, and see how they appear from night to night.

We see, at the first glance, that the stars vary much in brightness. The brightest ones—like Sirius, Capella, Arcturus, and Vega—are called stars of the *first magnitude*. Those less brilliant, like the six brightest of "the Dipper," are said to be of the *second* magnitude. All the stars which can be seen with the unaided eye are thus divided into six classes or *magnitudes*, according to their brightness.

CONSTELLATIONS. We also see that the stars are not uniformly distributed over the sky. They seem to be arranged in groups, some of which take the form of familiar objects. Every one knows the seven bright stars which are called "the Dipper." Another group resembles a *sickle*, another a *cross*, and so on. All the stars in the heavens have been divided into groups called constellations. Many of these were recognized and named at a very early period.

We should become familiar with these constellations in order to study the stars with any profit.

It is necessary, in the first place, to have some way of designating the stars in each constellation. Many of the brighter stars have proper names as Sirius, Arcturus, and Vega; but the great majority of them are marked by the letters of the Greek alphabet. The brightest star in each constellation is called α (alpha); the next brightest, β (beta); the next, γ (gamma); and so on. The characters and names of the Greek alphabet are as follows:

α, Alpha.	ν, Nu.
β, Beta.	ξ, Xi.
γ, Gamma.	o, Omicron.
δ, Delta.	π, Pi.
ϵ, Epsilon.	ρ, Rho.
ζ, Zeta.	σ, Sigma.
η, Eta.	τ, Tau.
θ, Theta.	υ, Upsilon.
ι, Iota.	ϕ, Phi.
κ, Kappa.	χ, Chi.
λ, Lambda.	ψ, Psi.
μ, Mu.	ω, Omega.

These letters are followed by the Latin name of the constellation. Thus Aldebaran is called α Tauri; Rigel, β Orionis; Sirius, α Canis Majoris.

If there are more stars in a constellation than can be named from the Greek alphabet, the Roman alphabet is used in the same way; and when both alphabets are exhausted, numbers are used.

CIRCUMPOLAR CONSTELLATIONS. One of the most important constellations, and one easily recognized, is the Great Bear, or Ursa Major. It is represented in Plate 1 on the Star Chart. It may be known by the seven stars forming "the Dipper." The Bear's feet are marked by three pairs of stars. These and the star in the nose can be readily found by means of the lines drawn on the chart. It may be remarked here, that in all cases the stars thus connected by lines are the leading stars of the constellation. The stars α and β are called the Pointers. If a line be drawn from β to α, and prolonged about five times the distance between them, it will pass near an isolated star of the second magnitude known as the Pole Star, or Polaris. This is the brightest star in the Little Bear, or Ursa Minor (Plate 2). It is in the end of the handle of a second "dipper," smaller than the one in the Great Bear.

On the opposite side of the Pole Star from the Great Bear, and at about the same distance, is another conspicuous constellation, called Cassiopeia. Its five brightest stars form an irregular W, opening towards the Pole Star (Plate 2).

About half-way between the two Dippers three stars of the third magnitude will be seen, the only stars at all prominent in that neighborhood. These belong to Draco, or the Dragon. The chart will show that the other stars in the body of the monster form an irregular curve around the Little Bear, while the head is marked by four stars arranged in a trapezium. Two of these stars, β and γ, are quite bright. A little less than half-way from Cassiopeia to the head of the Dragon is a constellation known as Cepheus, five stars of which form an irregular K.

These five constellations never set in our latitude, and are called circumpolar constellations.

CONSTELLATIONS VISIBLE IN SEPTEMBER. At this time the Great Bear will be low down in the northwest, and the Dragon's head nearly in the zenith. If we draw a line from ζ to η of the Great Bear and prolong it, we shall find that it will pass near a reddish star of the first magnitude. This star is called Arcturus, or α Boötis, since it is the brightest star in the constellation Boötes. Of its other conspicuous stars, four form a cross. These and the remaining stars of the constellation can be readily traced with the aid of Plate 3.

Near the Dragon's head (Plate 4) may be seen a very bright star of the first magnitude, shining with a pure white light. This star is Vega, or α Lyræ.

If we draw a line from Arcturus to Vega (Plate 3), it will pass through two constellations, the Crown, or Corona Borealis and Hercules. The former is about one-third of the way from Arcturus to Vega, and consists of a semicircle of six stars, the brightest of which is called Alphecca or Gemma Coronæ,—"the gem of the crown."

Hercules is about half-way between the Crown and Vega. This constellation is marked by a trapezoid of stars of the third magnitude. A star in one foot is near the Dragon's head; there is also a star in each shoulder, and one in the face.

Just across the Milky Way from Vega (Plate 5) is a star of the first magnitude, called Altair, or α Aquilæ. This star marks the constellation Aquila, or the Eagle, and may be recognized by a small star on each side of it. These are the only important stars in this constellation.

In the Milky Way, between Altair and Cassiopeia (Plate 4), there is a large constellation called Cygnus, or the Swan. Six of its stars form a large cross, by which it will be readily known. α Cygni is often called Deneb. If forms a large isosceles triangle with Altair and Vega.

Low down in the south, on the edge of the Milky Way (Plate 6), is a constellation called Sagittarius, or the Archer. It may be known by

I. STAR CHART OF THE PRINCIPAL CONSTELLATIONS

five stars forming an inverted dipper, often called "the Milk-dipper." The head is marked by a small triangle. The other stars, as seen by the map, may be grouped so as to represent a bow and an arrow.

Low in the southwest is a bright red star called Antares, or α Scorpionis.

The space between Sagittarius and Hercules and Scorpio is occupied by the Serpent (Serpens) and the Serpent-bearer, or Ophiuchus (Plates 6 and 7). The head of the Serpent is near the Crown, and marked by a small triangle. The head of Ophiuchus is close to the head of Hercules, and may be known by a star of the second magnitude. Each shoulder is marked by a pair of stars. His feet are near the Scorpion.

Nearly on a line with Arcturus and γ Ursæ Majoris (Plate 1), and rather nearer the latter, is an isolated star of the third magnitude, called Cor Caroli, or Charles' Heart. This is the only prominent star in the constellation of Canes Venatici, or the Hunting Dogs.

Cassiopeia is almost due east of the Pole Star. A line drawn from the latter through β Cassiopeiæ

II. STAR CHART OF THE PRINCIPAL CONSTELLATIONS

and prolonged, passes through two stars of the second and third magnitude. These, with two others farther to the south, form a large square, called the Square of Pegasus. Three of these, as seen by the chart (Plate 5), belong to the constellation Pegasus, or the Winged Horse. α Pegasi is called Markab, and β is called Algenib. The bright stars in the neck and nose can be found by the chart.

The fourth star in the Square of Pegasus belongs (Plate 8) to the constellation Andromeda. Nearly in a line with α Pegasi and this star are two other bright stars belonging to Andromeda. The stars in her belt may be found by the chart.

Following the direction of the line of stars in Andromeda just mentioned, and bending a little towards the east, we come to Algol, or β Persei, a remarkable variable star. This star may be readily recognized from the fact, together with β and γ Andromeda and the four stars in the Square of Pegasus, it forms a figure similar in outline to the Dipper in Ursa Major, but much larger. If the handle of this great Dipper is made straight instead of being bent, the star in the end of it is α

Persei, of the second magnitude. This star has one of the third magnitude on each side of it. The other stars in Perseus may be found by the chart.

Just below θ in the head of Pegasus (Plate 9) are three stars of the third and fourth magnitudes, forming a small arc. These mark the urn of Aquarius, the Water-bearer. His body consists of a trapezium of four stars of the third and fourth magnitudes. Small clusters of stars show the course of the water flowing from his urn.

This stream enters the mouth of the Southern Fish, or Piscis Australis. The only bright star in this constellation is Fomalhaut, which is of the first magnitude, and at this time will be low down in the southeast.

To the south of Aquarius is Capricornus, or the Goat. He is marked by three pairs of stars arranged in a triangle. One pair is in his head, another in his tail, and the third in his knees.

Near Altair (Plate 5), and a little higher up, is a small diamond of stars forming the Dolphin, or Delphinus.

A little to the west of the Dolphin, in the Milky Way, are four stars of the fourth magnitude, which form the constellation Sagitta, or the Arrow.

Constellations Visible in October. If we look at the heavens at eight o'clock on the 15th of October, we shall see that all the constellations described above have shifted somewhat towards the west. Arcturus and Antares have set. In the east, below Andromeda (Plate 10), we see a pair of bright stars, which are the only conspicuous ones in the constellation Aries, or the Ram.

About half-way between Aries and γ Andromedæ are three stars which form a small triangle. This constellation is called Triangulum, or the Triangle.

Between Aries and Pegasus is the constellation Pisces, or the Fishes. The southernmost Fish may be recognized by a pentagon of small stars lying below the back of Pegasus. There are no conspicuous stars in the other Fish, which is directly below Andromeda.

Constellations Visible in November. At eight o'clock in the evening on the 15th of November, we see at a glance that the constellations with which we have become acquainted have moved yet farther to the westward. Boötes, the Crown, Ophiuchus, and the Archer have set; Pegasus, Cassiopeia, and Andromeda are overhead; while new constellations appear in the east.

We notice at once (Plate 11) a very bright star in the northeast, directly below Perseus. This is Capella, or α Aurigæ. There are five other conspicuous stars in Auriga, or the Charioteer; and with Capella they form an irregular pentagon.

Somewhat to the eastward (Plate 12), and a little lower down, is a very bright red star. This is Aldebaran, or α Tauri. It is familiarly known as the Bull's eye. It will be noticed by the map that it is at one end of a V which forms the face of the Bull. This group is known as the Hyades. Somewhat above the Hyades is a smaller group, called the Pleiades,—more commonly known as the Seven Stars, though few persons can distinguish more than six. The bright star on the northern horn, or β Tauri, is also in the foot of Auriga, and counts as γ of that constellation.

All the space between Taurus and the Southern Fish, and below Aries and Pisces (Plate 13), is occupied by Cetus, the Whale. The head is marked by a triangle of rather conspicuous stars below Aries; the tail, by a bright star of the second magnitude, which is now just about as far above the horizon as Fomalhaut. On the body there are five stars, forming a sort of sickle. About half-way between this sickle and the triangle, in the head, is o Ceti, which is also called Mira, or the wonderful star.

Constellations Visible in December. At eight o'clock in the evening in the middle of December, we shall find that Hercules, Aquila, and Capricornus have sunk below the horizon; while Vega and the Swan are on the point of setting. The Great Bear is climbing up in the northeast. In the east we behold by far the most brilliant group of constellations we have yet seen. Capella and Aldebaran are now high up; and below the former (Plate 12) is the splendid constellation of Orion. His belt, made up of three stars in a straight line, will be recognized at once. Above this, on one shoulder, is a star of the first magnitude, called Betelgeuse, or α Orionis. About as far from the belt, on the other side, is another star of the first magnitude, called Rigel. There are two other fainter stars which form a large trapezium with Betelgeuse and Rigel. The three small stars below the belt are upon the sword.

Below Orion (Plate 14) is a small trapezium of stars which are in the constellation of Lepus, or the Hare. The head is marked by a small triangle, as seen on the map.

To the north of Orion, and a little lower down (Plate 12), are two bright stars near together, one of the first and the other of the second magnitude. The latter is called Castor, and the former Pullox. These stars are in the constellation of Gemini, or the Twins. A line of three smaller stars just in the edge of the Milky Way marks the feet, and another line of three the knees. Pollux forms a large triangle with Capella and Betelgeuse.

Constellations Visible in January. At eight in the evening on the 15th of January, Vega, Altair, the Dolphin, Aquarius, and Fomalhaut have disappeared in the west; Deneb and the Square of Pegasus are near the horizon; while Capella and Aldebaran are nearly overhead. Two stars of exceeding brilliancy have come up in the west. The one farthest to the south (Plate 14) is the brightest star in the whole heavens. It is called Sirius, or the Dogstar; and is in the constellation of Canis Major, or the Great Dog, which can be readily traced by the lines on the map.

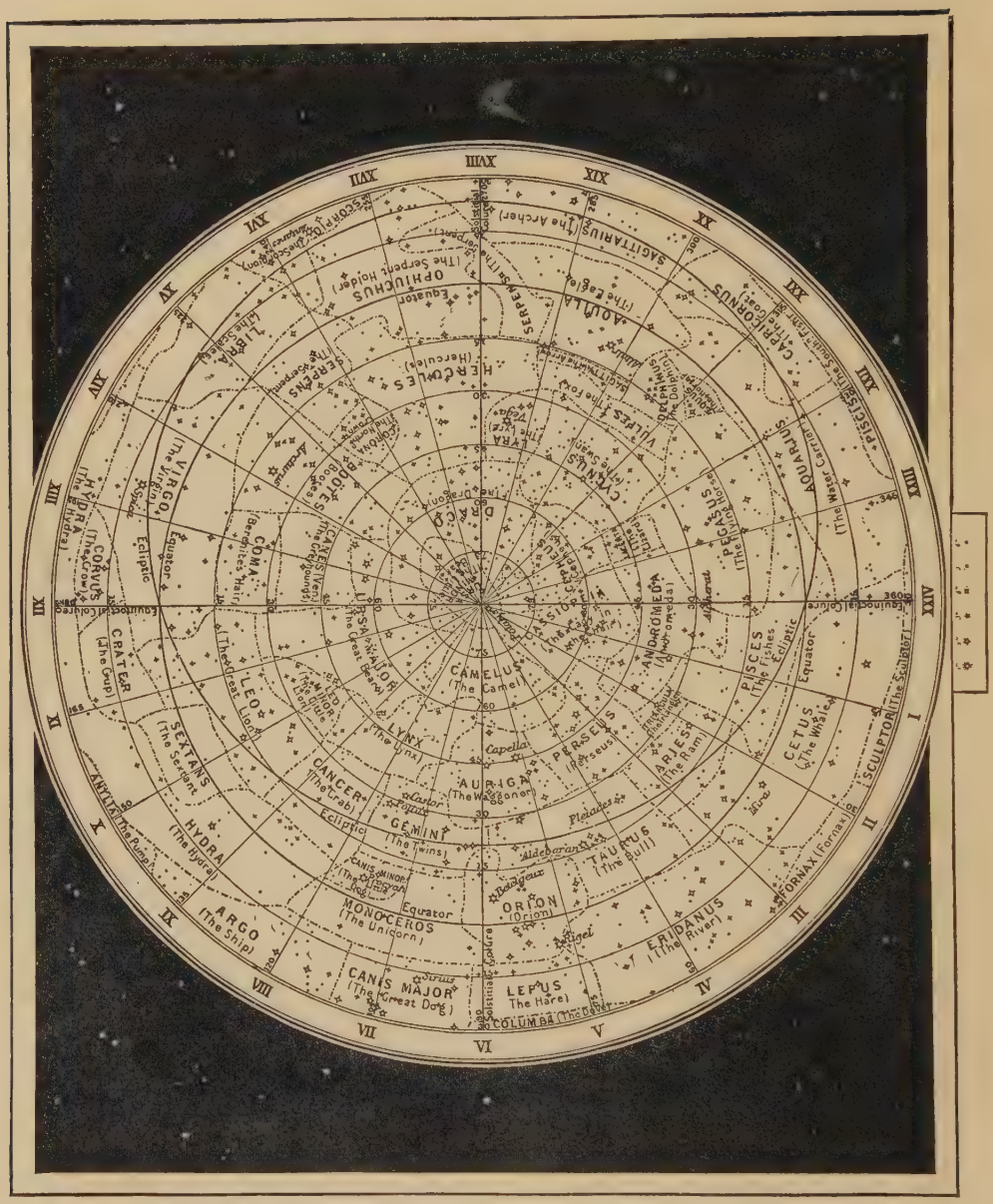
The other bright star is between Sirius and Pollux (Plate 12), and is called Procyon. It is in Canis Minor, or the Little Dog. The only other prominent star in this constellation is one of the third magnitude near Procyon.

Procyon, Sirius, and Betelgeuse form a large equilateral triangle.

Orion and the group of constellations about it constitute by far the most brilliant portion of the heavens, as seen in our latitude. There are, in all, only about twenty stars of the first magnitude, and seven of these are in this immediate vicinity.

Constellations Visible in February. If we look at the heavens at the same time in the evening about the middle of February, we shall miss Cygnus and Pegasus from the west. Auriga and Orion are nearly overhead.

Southeast of the Great Bear (Plate 15) is a red star of the first magnitude, called Regulus, in the



MAP SHOWING THE LOCATIONS OF NORTHERN CONSTELLATIONS

constellation of Leo, or the Lion. There are five stars near Regulus, which together with it form a group often called the Sickle. The star in the tail is Denebola, which makes a right-angled triangle with two others near it.

Between Leo and Gemini is the constellation Cancer, or the Crab. It contains no bright stars, but a remarkable cluster of small stars called Præsepe, or the Beehive.

Below Regulus (Plate 14) is a bright red star of the second magnitude, called Cor Hydræ, or the Hydra's Heart. The head of Hydra is marked by five small stars. The coils of the monster can be traced by the map. A portion of the constellation is on Plate 16.

Constellations Visible in March. At the middle of March, the heavens will have shifted round somewhat towards the west; but all the conspicuous constellations of the preceding month are still visible, while no new ones at all brilliant have come into view.

If we draw a line from the end of the Great Bear's tail to Denebola, it will pass through two constellations,—Canes Venatici, described above; and Coma Berenices, or Berenice's Hair, a large cluster of faint stars. (Plate 15).

MAP SHOWING THE LOCATIONS OF THE SOUTHERN CONSTELLATIONS AND ALSO MANY REMARKABLE NEBULAR FORMS

1. Double nebula in Gemini. 2. Double nebula of great brilliancy in Coma Berenicis. 3. Small double nebula. 4. Curiously shaped nebula in Ophiuchus. 5. Two nebulous spots in Canes Venatici. 6. Remarkable veil-like nebula in Lyra. 7. Elliptical nebula in Perseus. 8. Nebulous spot in Sagittarius, split into three pieces; a double star in center. 9. Large curiously-shaped nebula in Rober Caroli, filled with minute stars. 10. Great nebula in Andromeda, visible to the eye. 11. Nebula in Cetus. 12. Elongated nebula in Cygnus. 13. Brilliant round spots in Sagittarius. 14. Round spots in Andromeda. 15-16. Spots in Orion and Ursa Major. 17. Most remarkable of all nebula, in Orion. 18. Great oval nebula in Vulpes, containing two darker nebulæ. 19. Nebulous figure in Canis Venaticus. 20. Nebular clouds in the Southern hemisphere.

Constellations Visible in April. At the middle of April, Aries and Andromeda have set; Taurus, Orion and Canis Major are sinking towards the west; the Great Bear and the Lion are overhead; Arcturus has risen in the northeast (Plate 16); and some way to the south of this is seen a star of the first magnitude, which forms a large triangle with Arcturus and Denebola. It is called Spica

Virginis, and is the chief star in the constellation Virgo, or the Virgin. The stars on the breast and wings can be found with the aid of the map.

South of Virgo is a trapezium of four stars, which are in the constellation of Corvus, or the Crow.

Constellations Visible in May. At the middle of May, Taurus, Orion, and Canis Major have set; Vega has just come up in the northeast; and between Vega and Arcturus we again see Hercules and Corona. Below Spica are two stars of the second magnitude, belonging to the constellation Libra, or the Balance. Another star of the fourth magnitude forms a triangle with these, and marks one pan of the balance. (Plate 7).

Constellations Visible in June. In June we shall find that Canis Minor, Perseus, Auriga, and Gemini have either set, or are on the point of setting; Arcturus is overhead; Cygnus and Aquila are just rising. Ophiuchus is well up; and low in the southeast we see again the red star Antares, in the constellation Scorpio, or the Scorpion (Plate 6). There is a star of the third magnitude on each side of Antares, and several stars of the third and fourth magnitudes in the head and claws. The configuration of these stars is much like a boy's kite with a long tail. Scorpio is a very brilliant constellation, and is seen to better advantage in July and August.

Constellations Visible in July and August. We have now described all the important constellations visible in our latitude. Those which are seen in July and August are mainly those described under the last two or three months, and under September.

Southern Circumpolar Constellations. There are a number of constellations near the South Pole of the heavens which never rise in our latitude, just as there are certain ones near the North Pole which never set. These are called the southern circumpolar constellations.

CONSTELLATIONS VISIBLE EACH MONTH

The following table gives the constellations visible at eight o'clock in the evening about the middle of each month. The stars opposite the names of the constellations indicate those visible in the month designated at the top.

NAME OF CONSTELLATION	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.
Ursa Major (*er'sa mā'jor*). The Greater Bear	★	★	★	★	★	★	★	★	★	★	★	★
Ursa Minor (*er'sa mī'nor*). The Lesser Bear	★	★	★	★	★	★	★	★	★	★	★	★
Draco (*drak'ō*). Dragon	★	★	★	★	★	★	★	★	★	★	★	★
Cassiopeia (*kas-si-o-pē'a*). Lady's Chair	★	★	★	★	★	★	★	★	★	★	★	★
Cepheus (*sē'fe-us*)	★	★	★	★	★	★	★	★	★	★	★	★
Bootes (*bo-ō'tēz*). The Oxdriver or Plowman	★							★	★	★	★	★
Corona Borealis (*kō-rō'na bō-rē-ā'lis*). The Northern Crown	★	★							★	★	★	★
Ophiuchus (*of-i-u'kus*). The Serpent Bearer	★									★	★	★
Sagittarius (*saj-i-tā'ri-us*). The Archer	★										★	★
Hercules (*her'ku-lēz*)	★	★							★	★	★	★
Lyra (*lī'ra*). The Lyre	★	★	★							★	★	★
Aquila (*ak'wil-a*)	★	★	★								★	★
Delphinus (*del'fin-us*). Dolphin	★	★	★								★	★
Capricornus (*kap-ri-kor'nus*). The Goat	★	★	★									★
Cygnus (*sig'nus*). The Swan	★	★	★	★						★	★	★
Sagitta (*saj'it-ta*). The Arrow	★	★	★								★	★
Aquarius (*a-kwā'ri-us*). The Water-bearer	★	★	★	★								
Piscis Australis (*pis'sis aw-strā'lis*). The Southern Fish	★	★	★	★								
Pegasus (*peg'a-sus*). The Winged Horse	★	★	★	★	★							
Andromeda (*an-drom'e-da*)	★	★	★	★	★	★	★					
Perseus (*per'sus*)	★	★	★	★	★	★	★	★				
Aries (*a'ri-ēz*). Ram		★	★	★	★	★	★					
Pisces (*pis'sēz*). Fishes		★	★	★	★							
Cetus (*sē'tus*). The Whale			★	★	★	★						
Triangulum (*trī-ang'u-lum*). The Triangle			★	★	★	★	★					
Auriga (*aw-ri'ga*). The Waggoner or The Charioteer			★	★	★	★	★	★	★			
Taurus (*tau'rus*). The Bull			★	★	★	★	★	★				
Lepus (*lep'us*). The Hare				★	★	★	★					
Orion (*ō-rī'on*). Giant and Hunter				★	★	★	★	★				
Gemini (*jem'i-ni*). The Twins				★	★	★	★	★	★			
Canis Major (*kā'nis mā'jor*). The Great Dog					★	★	★	★				
Canis Minor (*kā nis mī'nor*). The Little Dog					★	★	★	★	★			
Cancer (*kan'ser*). The Crab						★	★	★	★	★		
Hydra (*hī'dra*). The Snake						★	★	★	★	★		
Leo (*lē'ō*). The Lion						★	★	★	★	★	★	
Coma Berenices (*kō'ma ber-e-nī'sēz*). Hair of Berenice							★	★	★	★	★	★
Canes Venatici (*ka'nēz vē-nā'ti-si*). The Hunter's Dogs							★	★	★	★	★	★
Virgo (*ver'gō*). The Virgin								★	★	★	★	★
Corvus (*kor'vus*). The crow								★	★	★	★	
Libra (*li'bra*). Balance								★	★	★	★	
Scorpio (*skor'pi-ō*). The Scorpion										★	★	★

THE WONDERFUL MILKY WAY

Everyone knows the Milky Way. It is one of the most striking sights of a clear night, for only on clear, moonless nights can we see its cloudy track of light across the heavens. More than any other celestial object it affects us with a sense of mystery and of unknown destiny as, indeed, it has affected men at all times and in all countries. To the American Indian it was the "path of souls." In ancient mythology it had various meanings: thus, it was the highway of the gods to Olympus; or it sprang from the ears of corn dropped by Isis as she fled from her pursuer; or it marked the original course of the sun, which he later abandoned. In mediæval times it became associated by pilgrims with their own journeys.

It stretches like a vast ragged semicircle over the sky. Indeed, it traces a rough circle, for this line is continued over the southern hemisphere also. The circle is, however, very far from being smooth or even; the path is full of irregularities. It varies in width to an extent of about thirty degrees, and varies also considerably in brightness. Its total area has been estimated to cover rather less than one-fourth of the whole northern hermisphere of the sky, and to cover about one-third of the southern hemisphere. Its track lies through the constellations Cassiopeia and Auriga; it passes between the feet of Gemini and the horns of Taurus, through Orion just above the giant's club, and through the neck and shoulder of Monoceros. It passes above Sirius into Argo, here entering the southern hemisphere, and through Argo and the Southern Cross into the Centaur. In the Centaur the Milky Way divides into two streams, in a manner which suggests the divided course of a river around an island, a dark rift between the two luminous streams representing the island.

It is a very long island, however, for the double conformation of the Milky Way extends over one-third of its entire course—that is to say, one hundred and twenty degrees of the circle. The divergent branches reunite in the northern hemisphere in the constellation Cygnus. The brighter stream passes through Norma, Ara, Scorpio and Sagittarius; along the bow of Sagittarius into Antinous, here entering the northern hemisphere again; then through Aquila, Sagitta, and Vulpecula it arrives at Cygnus and reunion with the branch which left it in Centaur. From Cygnus the stream, now single, passes through Lacerta and the head of Cepheus to the point whence we started, in Cassiopeia.

As we follow the Milky Way throughout its course, we find it continually sending out streaming appendages of nebulous appearance towards clusters, nebulæ, or groups of stars. In Norma it sends out a complicated series of nebulous streaks and patches, covering the Scorpion's tail, spreading faintly over the leg of Ophiuchus, and extending beyond, as if to meet a corresponding branch sent off from the region of Cygnus in the northern hemisphere. The latter is a very bright and remarkable streak, running south through Cygnus and Aquila, to become lost in a dim and sparsely starred region. From Cassiopeia a vivid branch proceeds to the chief star of Perseus, and faint streaks appear to continue the "feeler" towards the Hyades and the Pleiades. There are many other "feelers" of the same kind, and they are all of great interest, because they seem to show some sort of influence exercised by the Milky Way upon the whole starry universe.

ANCIENT AND MODERN CONCEPTIONS OF THE NATURE OF THE MILKY WAY. Strange theories as to the nature of the Milky Way have been put forward at various times. Anaxagoras thought it might be due to the shadow of our globe; Aristotle, that it was some kind of mist due to the exhalation of vapors from the earth.

But a grander and truer conception of its nature and situation, removed far from the earth and independent of any terrestrial cause, had early come to several minds. Pythagoras and Democritus both formed the conjecture that its shimmer might be due to innumerable stars, and Galileo's telescope confirmed their theory.

As we have seen, the Milky Way is by no means a simple stream of stars; with careful observation, even the naked eye can perceive something of its irregular detail, when the atmosphere is unusually clear, and there is no moon. Viewed

THE STARRY GRANDEUR OF THE MILKY WAY

COURSE OF THE MILKY WAY THROUGH THE TWO HEMISPHERES OF THE HEAVENS

These two drawings show the two semi-circles of the Milky Way as they extend from the regions of the Polar Star to the region of the Southern Cross on each side of the apparent sphere of the heavens. It will be noticed that the bright stars congregate near its region, and that there is a characteristic harmony in the way in which the wisps appear to project into space, suggesting some common cause for this appearance throughout the whole galaxy.

under these conditions through a good telescope, the effect of the Milky Way, when made to pass progressively before the vision, is one of unexampled grandeur and sublimity.

The general effect has been well likened to that of an old, gnarled tree-trunk, marked with knots and curving lines, and riddled with dark holes and passages, linked together by shimmering wisps or arches. This general effect is practically lost as the detail becomes clear in a telescopic view. The detail is extremely various. At one point it may consist of separate stars scattered irregularly upon a background of darkness; at another, of star-clusters, sometimes following one upon another in long, processional line; at another, the stars seem to collect in small, soft clouds, presenting the appearance, as the telescope sweeps over them, of drifting foam.

The Strange, Dark Rifts in the Skyscape Where No Stars Appear. At yet another point the track may be involved in nebulosity in which many stars appear to be imbedded. Perhaps the most characteristic features are several which have already been remarked as conspicuous in star-clusters or nebulæ, such as lines of stars, dark lanes or rifts, and dark holes. The lines of stars, which are evidently connected by some actual physical relation, are either straight, curved, radiated, or in parallels. In Sagittarius is a very striking collection of about thirty stars resembling in form a forked twig with a curved hook at the unforked end. The dark rifts in the Milky Way show the same features as those in star-clusters. Sometimes they are parallel; sometimes they radiate like branches from a common center; sometimes they are lines with bright stars; sometimes they are quite black, as if utterly void; sometimes slightly luminous, as if powdered with small stars.

It can be by no accident or chance that in the vast edifice of the heavens objects of certain classes should crowd into the belt of the Milky Way, and other classes avoid it; it points to the whole forming a single growth, an essential unity. For there is but one belt in the heavens, like the Milky Way, a belt in which small stars, new stars, and planetary nebulæ find their favorite home; and that belt encircles the entire heavens; and similarly that belt is the only region from which the white nebulæ appear to be repelled. The Milky Way forms the foundation, the strong and buttressed wall of the celestial building; the white nebulæ close in the roof of its dome.

Nebulae and the Theory of the Universe

It has already been observed that a number of stars are arranged in clusters of groups, while others, like our own sun, are at vast distances from their nearest neighbors. Some of these clusters, of which the Pleiades afford the best example to the naked eye, can be resolved by a keen eye into separate stars; some, like Præsepe in Cancer, which only show to the naked eye as a hazy spot of light, break up in a good field-glass into clusters of stars; but the majority of stellar clusters require a powerful telescope for their resolution.

It was long ago noticed that, the more powerful a telescope was, the greater was the number of these hazy spots of light which it would resolve into clusters of stars. Consequently the opinion was formed that all the hazy little clouds or nebulæ which are so prevalent throughout a large part of the sky were simply clusters of stars, so far away that their light merged into a single impression on the eye. A great number of these nebulæ were only resolved by large telescopes; many were found to be irresolvable by any telescope. It was simply concluded from this that they were still more distant that the clusters which had yielded to the resolving powers of the telescope; and it was further supposed that each of these clusters of stars might be a separate universe or galaxy, comparable in extent and importance with our own universe, bounded by the vast girdle of the Milky Way.

The Nebular Hypothesis. This grand conception of innumerable universes scattered throughout space was speedily destroyed by the spectroscope, which distinguishes with entire certainty between the light sent to us from a solid star and that emitted by a gas. When it was turned upon the nebulæ which had been supposed in reality to be star-clusters so distant that no telescope could resolve them, it showed unmistakably that these nebulæ were not star-groups, but simply masses of incandescent gas.

Besides, nebulæ vary greatly in form and appearance; some are clearly clusters of stars, others are perfectly hazy. A round or oval form is sometimes exhibited, with a gradual condensation towards the center, and a number of stars standing in the center of a nebulous haze can be observed. Such observations on nebulæ caused Kant and Laplace to suggest a theory—now known as the nebular theory—as to the formation of worlds. They considered that the solar system, for example, originally existed as uncondensed nebulous matter. This gradually condensed towards the center, forming the nucleus of the sun, and later the outer parts separated into distinct parts, each part condensing into a planet. The different forms of nebulæ observed in the heavens are then supposed to be systems in different stages of development.

THE VARIED COLOR OF THE STARS

Many of the stars shine with colored light, as red, blue, green, or yellow.

These colors are exhibited in striking contrast in many of the double stars. Combinations of blue and yellow, or green and yellow, are not uncommon; while in fewer cases we find one star white and the other purple, or one white and the other red. In several instances each star has a rosy light.

The following are a few of the most interesting colored double stars:

Name of Star	Color of Larger One	Color of Smaller One
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α Herculis	Orange	Emerald Green.

Single stars of a fiery red or deep orange color are common enough. Of the first color may be mentioned Aldebaran, Antares and Betelgeuse. Arcturus is a good example of an orange star. Isolated stars of a deep blue or green color are very rarely found; among the conspicuous stars, β Libræ appears to be the only instance.

It is now a well-established fact that the stars change their color. Sirius was described as a fiery red star by the ancients, is now decided green color.

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INCLUDING THOSE OF FIRST MAGNITUDE

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Aldebaran	The Follower	α Tauri.
Algenib	The Side	γ Pegasi.
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Spica	The Ear of Corn	α Virginis.
Vega	The Swooping Eagle	α Lyræ.

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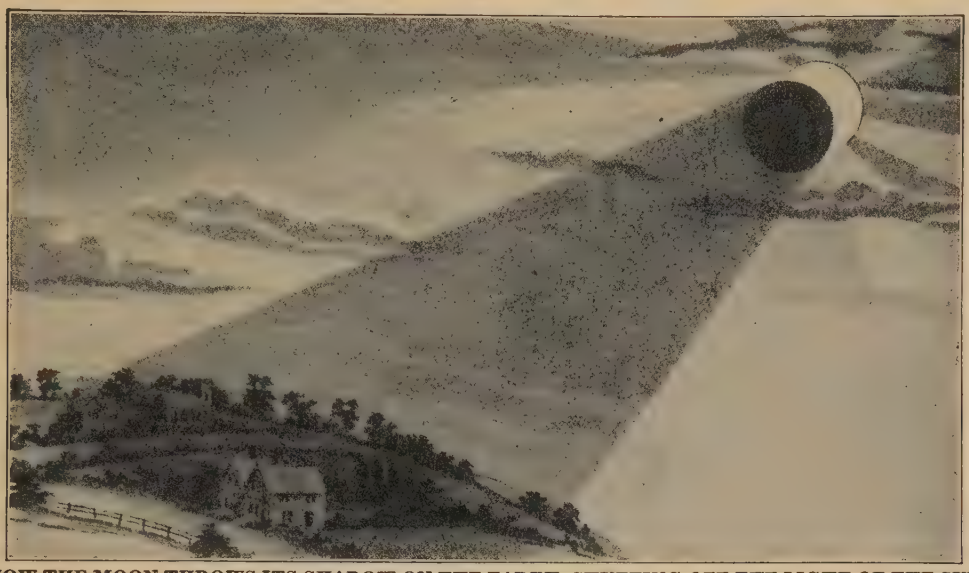
When the earth is between the moon and the sun in a line, the moon lies in the shadow of the earth, and so suffers temporary obscuration; a *lunar eclipse* then takes place. When the moon passes between the earth and the sun, the latter is at certain places on the earth obscured by the dark body of the moon, and a *solar eclipse* takes place.

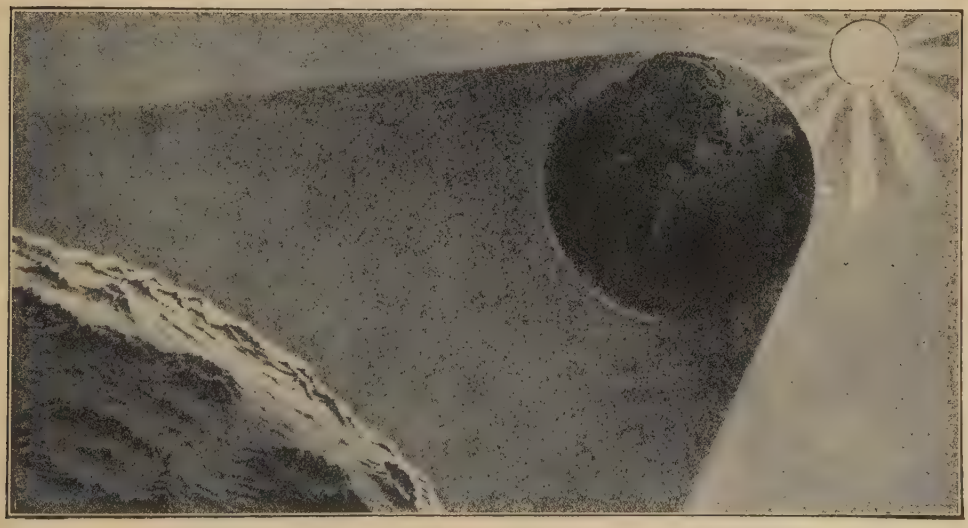
LUNAR ECLIPSES. The shadow cast by the earth is conical, and may be shown to extend about one million miles from its surface. At a distance of a quarter of a million miles away the width of this shadow is about six thousand miles; and if the moon passes into it at that approximate distance from the earth, its disc of two thousand miles

GIANT SHADOWS CAST BY THE EARTH AND MOON



HOW THE MOON THROWS ITS SHADOW ON THE EARTH, SHUTTING OFF THE LIGHT OF THE SUN

HOW THE MOON COMES BETWEEN THE EARTH AND SUN, CAUSING THE SHADOW SHOWN ABOVE



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On its way through space the moon passes sometimes between the sun and the earth, shutting off the sunlight from the earth, as shown in the top picture. The drawing in the middle shows us that the moon does not hide the sunlight from the whole of the earth, but only from a part of it. But in the part from which the sun is hid the moon's shadow makes day so dark that we can see the stars. We call this an eclipse of the sun. Sometimes, too, the earth passes between the moon and the sun so as to cut off all sunlight from the moon, as shown in the bottom picture. We call this an eclipse of the moon.

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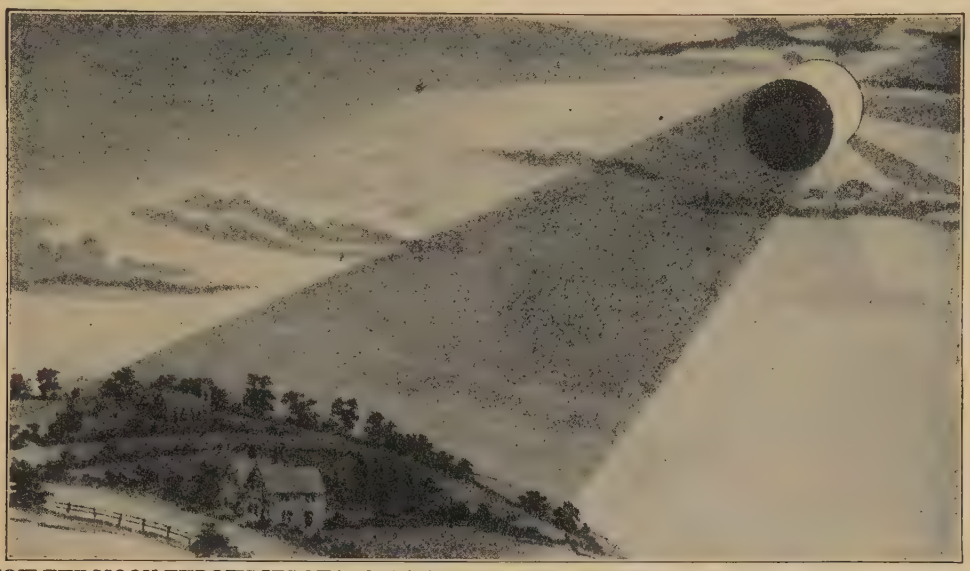

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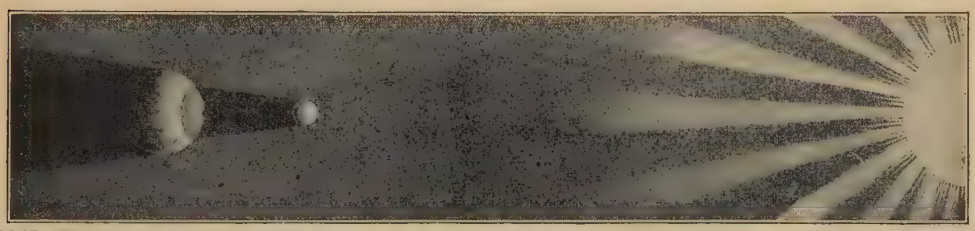

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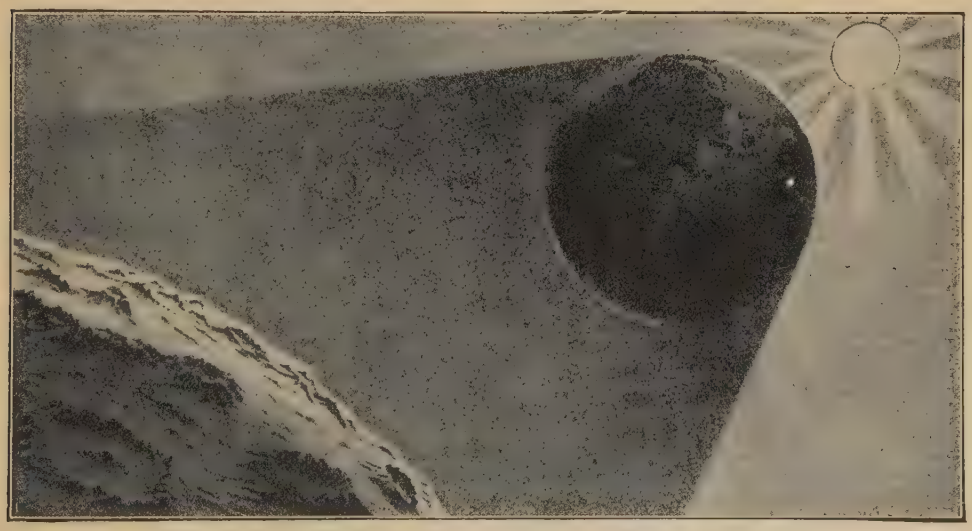

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diameter may be partially or totally obscured. The moon and sun may be on opposite sides of the earth, and yet the former not in shadow. This is due to the fact that the moon's orbit round the earth is not exactly in the same plane as that of the earth's orbit round the sun. If it were so, we should have total eclipses at every full moon; but since the two planes are inclined to each other at an angle of 5° 9′, eclipses will occur when the moon is at or near its *nodes* or positions of coincidence with the plane of the ecliptic. Partial eclipses are produced when only a portion of the moon passes into shadow; annular eclipses such as are sometimes observed in the case of the sun cannot occur with the moon.

Solar Eclipses. The shadow cast by the moon is also conical, and extends over a slightly varying distance of about a quarter of a million miles from the moon's surface. This being the approximate distance of the moon from the earth, it is seen that when the moon is between the earth and the sun the shadow may reach the earth. The extreme limit of the shadow may range from twenty-three thousand miles short of the earth, in which case an entire eclipse of the sun is impossible, to fifteen thousand miles beyond the earth. In the latter case a circular shadow will be projected on the surface of the globe, travelling onwards slowly in the direction of the motion of the moon. Within this shadow or *umbra* the body of the sun cannot be observed, and a total eclipse prevails. A circular region exists round this shadow, in which only part of the sun is visible; this region is therefore partly in shadow, and is called the *penumbra*. Outside the penumbra the whole sun may be viewed; the moon's shadow is not nearly large enough to render a solar eclipse co-existent over all parts of the earth's face towards the sun.

THE MYTHOLOGY OF THE CONSTELLATIONS

To the Greeks the starry heavens were an illustrated mythological poem. Every constellation was a picture, connected with some old fable of gods or heroes.

The two Bears have one story. Callisto was a nymph beloved by Jupiter, who changed her into a she-bear to save her from the jealous wrath of Juno. But Juno learned the truth, and induced Diana to kill the bear in the chase. Jupiter then placed her among the stars as Ursa Major, and her son Arcas afterwards became Ursa Minor. Juno, indignant at the honor thus shown the objects of her hatred, persuaded Tethys and Oceanus to forbid the Bears to descend, like the other stars, into the sea.

According to Ovid, Juno changed Callisto into a bear; and when Arcas, in hunting, was about to kill his mother, Jupiter placed both among the stars.

Uras Minor was also called Phœnice, because the Phœnicians made it their guide in navigation, while the Greeks preferred the Great Bear for that purpose. It was also known as Cynosura (dog's tail) from its resemblance to the upturned curl of a dog's tail. The Great Bear was sometimes called Helice (winding), either from its shape or its curved path.

Boötes (the Herdsman) was also called Arctophylax and Arcturus, both of which names mean the guard or keeper of the bear. According to some of the stories, Boötes was Arcas; according to others, he was Icarus, the unfortunate son of Dædalus. The name Arcturus was afterwards given to the chief star of the constellation.

Cepheus, Cassiopeia, Andromeda, Perseus, and Pegasus are a group of star-pictures illustrating a single story.

Cepheus and Cassiopeia were the king and queen of Ethiopia, and had a very beautiful daughter, Andromeda. Her mother boasted that the maiden was fairer than the Nereids, who in their anger persuaded Neptune to send a sea-monster to ravage the shores of Ethiopia. To appease the offended deities Andromeda, by the command of an oracle, was exposed to this monster. The hero Perseus rescued her and married her.

Pegasus, the winged horse, sprang from the blood of the frightful Gorgon, Medusa, whom Perseus had slain not long before he rescued Andromeda from the sea-monster. According to the most ancient account, Pegasus became the horse of Jupiter, for whom he carried the thunder and lightning; but he afterward came to be considered the horse of Aurora, and finally of the Muses. Modern poets rarely speak of him except as connected with the Muses.

The Dragon, according to some of the poets, was the one that guarded the golden apples of the Hesperides; according to others, the monster sacred to Mars which Cadmus killed in Bœotia.

The Lyre is said to be the one which Apollo gave to Orpheus. After the death of Orpheus, Jupiter placed it among the stars at the intercession of Apollo and the Muses.

The Crown was the bridal gift of Bacchus to Ariadne, transferred to the heavens after her death.

Aquila is probably the eagle into which Merops was changed. It was placed among the stars by Juno. Some, however, make it the Eagle of Jupiter.

Cygnus or Cycnus, according to Ovid, was a relative of Phaëthon. While lamenting the unhappy fate of his kinsman on the banks of the Eridanus, he was changed by Apollo into a swan, and placed among the stars.

Sagittarius was said by the Greeks to be the Centaur Cheiron, the instructor of Peleus, Achilles

and Diomed. It is pretty certain, however, that all the zodiacal constellations are of Egyptian origin, and represent twelve Egyptian deities who presided over the months of the year. Thus Aries was Jupiter Ammon; Taurus, the bull Apis; Gemini, the inseparable gods Horus and Harpocrates; and so on. The Greeks adopted the figures, and invented stories of their own to explain them.

Scorpio, in the Egyptian zodiac, represented the monster Typhon. Originally this constellation extended also over the space now filled by Libra.

Ophiuchus represents Æsculpius, the god of medicine. Serpents were sacred to him, probably because they were a symbol of prudence and renovation, and were believed to have the power of discovering herbs of wondrous powers.

Aquarius, in Greek fable, was Ganymede, the Phrygian boy who became the cup-bearer of the gods in place of Hebe.

Taurus, as has been stated above, was the Egyptian Apis. The Greeks made it the bull which carried off Europa. The Pleiades are usually called the daughters of Atlas, whence their name Atlantides. Milton speaks of them as "the seven Atlantic Sisters."

According to one legend the seventh was Sterope, who became invisible because she had loved a mortal; according to another, her name was Electra, and she left her place that she might not witness the downfall of Troy, which was founded by her son, Dardanus.

The Hyades, according to one of several stories, were sisters of the Pleiades. The name probably means "the Rainy," since their rising announced wet weather.

Cetus is said by most writers to be the sea-monster from which Perseus rescued Andromeda.

Orion was a famous giant and hunter, who loved the daughter of Oinopion, King of Chios. As her father was slow to consent to her marriage, Orion attempted to carry off the maiden; whereupon Oinopion, with the help of Bacchus, put out his eyes. But the hero, in obedience to an oracle, exposed his eye-balls to the rays of the rising sun, and thus regained his sight. The accounts of his subsequent life, and of his death, are various and conflicting. According to some, Aurora loved him and carried him off; but, as the gods were angry at this, Diana killed him with an arrow. Others say that Diana loved him, and that Apollo, indignant at his sister's affection for the hero, once pointed out a distant object on the surface of the sea, and challenged her to hit it. It was the head of Orion swimming, and the unerring shot of the goddess pierced it with a fatal wound. Another fable asserts that Orion boasted that he would conquer every animal; but the earth sent forth a scorpion which destroyed him.

Canis Major and Minor are the dogs of Orion, and are pursuing the Hare.

The Twins, Castor and Pullox, the sons of Jupiter and Leda, are the theme of many a fable. They were especially worshipped as the protectors of those who sailed the seas, for Neptune had rewarded their brotherly love by giving them power over winds and waves, that they might assist the shipwrecked.

Leo, according to the Greek story, was the famous Nemean lion slain by Hercules. Jupiter placed it in the heavens in honor of the exploit.

The Hydra also commemorates one of the twelve labors of Hercules—the destruction of the hundred-headed monster of the Lernæan lake.

Virgo represents Astræa, the goddess of innocence and purity, or, as some say, of justice. She was the last of the gods to withdraw from earth at the close of "the golden age."

Libra, or the Balance, is the emblem of justice, and is usually associated with the fable of Astræa.

Argo Navis is the famous ship in which Jason and his companions sailed to find the Golden Fleece.

This slight sketch of the leading fables connected with the constellations will serve to show how completely the Greeks "nationalized the heavens."

SCIENTIFIC TERMS USED IN ASTRONOMY

Astronomy (*as-tron'om-i*). The science which treats of the heavenly bodies, explaining the motions, times and causes of the motions, distances, magnitudes, gravities, light, etc., of the sun, moon, and stars, the nature and causes of the eclipses of the sun and moon, the conjunction and apposition of the planets, and any other of their mutual aspects, with the times when they did or will happen.

Aberration (*ab-er-ā'shun*). A small apparent motion of the fixed stars, occasioned by the progressive motion of light and the earth's annual motion in its orbit. By this they sometimes appear twenty seconds distant from their true situation.

Amplitude (*am'pli-tud*). An arc of the horizon intercepted between the true east and west points and the center of the sun, or a star at its rising or setting.

Anomaly (*an-om'al-i*). The angular distance of a planet from its perihelion, as seen from the sun; either true, mean, or eccentric.

Aphelion (*af-ēl'yun*). That point of a planet's orbit which is most distant from the sun.

Apogee (*ap'o-jē*). That point in the orbit of the moon which is at the greatest distance from the earth.

Apparition (*ap-par-ish'un*). The first appearance of a star or other luminary after having been obscured.

Ap'pulse The approach of a planet towards a conjunction with the sun or any of the fixed stars.

Apsis (*ap'sis*). The two points of a planet's orbit in which it is at its greatest and least distance from the sun.

Aquarius (*a-kwā'ri-us*). The eleventh sign of the zodiac, which the sun enters about the 21st of January.

Asteroids (*as'ter-oids*). The small planets that circulate between the orbits of Mars and Jupiter.

Ax'is (*ax'is*). The imaginary line passing through the center and poles of the earth, on which it performs its diurnal revolutions from west to east.

Azimuth (*az'im-uth*). An arc of the horizon intercepted between the meridian of the place and the vertical circle passing through the center of a celestial object.

Can'cer. The fourth sign of the zodiac, being that of the summer solstice, which the sun enters about the 21st of June.

Capricorn (*kap'ri-korn*). The tenth sign of the zodiac, which the sun enters about the 21st of December, at the winter solstice.

Colure (*kol'ur*). Two great circles, supposed to intersect each other at right angles in the poles of the world, one of them passing through the solstitial and the other through the equinoctial points of the ecliptic, viz., Cancer and Capricorn, aries and Libra, dividing the ecliptic into four equal parts.

Coma (*kō'ma*). A dense, nebulous covering, which surround the nucleus or body of a comet.

Com'et. A member of the solar system, commonly consisting of three parts: the nucleus, the envelope or coma, and the tail; but one or more of these parts is frequently wanting.

Conjunc'tion. The meeting of two heavenly bodies in the same point or place in the heavens.

Constella'tion. A number of stars which appear as if situated near each other in the heavens, and are considered as forming a particular division.

Cynosure (*sin'o-shōōr* or *sī'*). A name of the constellation Ursa Minor, or the Lesser Bear, which contains, in the tail, the pole star by which mariners are guided.

Declination (*dek-lin-a'shun*). Distance of any object from the celestial equator, either northward or southward.

Disk. The face or visible projection of a celestial body, usually predicated of the sun, moon, or planets; but the stars have also apparent disks.

Eclipse'. An obscuration or interception of the light of the sun, moon, or other luminous body.

Eclip'tic. The great circle of the heavens which the sun appears to describe in his annual revolution.

Equa'tor. The great circle of the sphere, equally distant from the two poles of the world, or having the same poles as the world.

Equinox (*ē'kwi-noks*). The precise time when the sun enters one of the equinoctial points, making the day and night of equal length.

Faculae (*fa'ku-lē*). Certain spots sometimes seen on the sun's disk, which appear brighter than the rest of his surface.

Fixed Stars. Those which retain the same or very nearly the same position with respect to each other.

Gal'axy. The Milky-Way.

Gemini (*jem'i-nī*). The third sign or constellation in the zodiac, which the sun enters about the 21st of May.

Geocentric (*jē-o-sen'trik*) **Par'allax.** The apparent change of a body's place that would arise from a change of the spectator's station from the surface to the center of the earth.

Ha'lo. A luminous circle, usually prismatically colored round the sun or moon, and supposed to be caused by the refraction of light through crystals of ice in the atmosphere.

Heliocentric (*hē-li-o-sen'trik*) **Par'allax.** The arc of the great circle of the celestial sphere, drawn from the heliocentric to the geocentric place of a body.

Heliometer (*hē-li-om'e-ter*). An instrument for measuring with exactness the apparent diameter of the sun, moon, planets, etc.

Hori'zon. A circle touching the earth at the place of the spectator, and bounded by the line in which the earth and skies seem to meet.

Le'o (Lat., the Lion). The fifth sign of the zodia which the sun enters about the 22d of July.

Libra (*lī'bra*), the Balance. The seventh sign of the zodiac, which the sun enters at the autumnal equinox, in September.

Luna'tion. The period of a revolution of the moon round the earth, or the time from one new moon to the next.

Maculae (*mak'u-lē*). Dark spots on the surfaces of sun and moon, and on some of the planets.

Moon. A secondary planet or satellite of the earth, whose light, borrowed from the sun, serves to dispel the darkness of night.

Nadir (*nā'dir*). The point of the heavens or lower hemisphere directly opposite the zenith.

Neb'ulae (*neb'u-lē*). Misty appearances among the stars, usually, but not always, resolved by telescope into myriads of small stars.

Nodes (*nōdes*). The two points in which the orbit of a planet intersects the ecliptic.

Nuta'tion. A vibratory motion of the earth's axis, arising from periodical fluctuations in the obliquity of the ecliptic.

Occulta'tion. The hiding of a heavenly body from our sight by the intervention of some other of the heavenly bodies.

Or'bit. The path described by a heavenly body in its periodical revolution.

Par'allax. The change of place in a heavenly body in consequence of being viewed from different points.

Penum'bra. A partial shadow or obscurity on the margin of the perfect shadow in an eclipse, or between the perfect shadow, where the light is entirely intercepted, and the full light.

Perigee (*per'i-jē*). That point in the orbit of the sun or moon in which it is at the least distance from the earth.

Perihelion (*per-i-hē'li-on*). That part of the orbit of a planet or comet in which it is at its least distance from the sun.

Plan'et. The name given to a few bright and conspicuous stars which are constantly changing their apparent situations in the celestial sphere.

Precession (*pre-sesh'un*) **of the Equinoxes.** A continual shifting of the equinoctial points from east to west.

Radius Vector. An imaginary line joining the center of the sun and the center of a body revolving about it.

Retrocession (*rē-tro-sesh'un*) **of the Equinoxes.** The going backward of the equinoctial points.

Sagittarius (*saj-i-tā'ri-us*). One of the twelve signs of the zodiac, which the sun enters about November 22.

Sat'ellite. A small planet revolving round another planet.

Scor'pio. The eighth sign of the zodiac, which the sun enters about October 23.

Selenography (*sel-en-og'raf-i*). The description of the surface of the moon.

Sign. The twelfth part of the ecliptic.

Solstice (*sol'stis*). The time when the sun, in its annual revolution, arrives at that point in the ecliptic farthest north or south of the equator, or reaches its greatest northern or southern declination.

Star. An apparently small, luminous body in the heavens, that shines in the night, or when its light is not obscured by clouds or lost in the brighter effulgence of the sun.

Sun. The central body of our system, about which all the planets and comets revolve, and by which their motions are regulated and controlled.

Taurus (*taw'rus*). The second sign of the zodiac, which the sun enters about the 20th of April.

Virgo (*ver'go*). The sixth sign of the zodiac, which the sun enters in August.

Ze'nith. The point in the heavens directly overhead.

BOOK OF THE EARTH

THE EARTH AS A PLANET

ITS STRUCTURE: Interior, Crust, Rocks, Fossils, Heat

GEOLOGICAL VIEW OF GROWTH OF THE EARTH

SURFACE OF THE EARTH: Land Forms: Continents, Islands, Mountains, Plains; Water Forms: Springs, Rivers, Lakes, Oceans

CELEBRATED MOUNTAIN PEAKS AND RANGES

ATMOSPHERE, CLIMATE AND WEATHER

NATURAL WONDERS AND FORCES: Volcanoes, Earthquakes, Geysers, Caverns, Waterfalls, Whirlpools, Tides, Deserts, Ocean Depths, Clouds, Seasons, Glaciers, Icebergs, Snow, Rain, Hail, Dew, Coral Islands and Reefs

DICTIONARY OF MINERAL PRODUCTS

TABLES FOR THE IDENTIFICATION OF MINERALS

GEMS AND PRECIOUS STONES

PRONOUNCING DICTIONARY OF SCIENTIFIC TERMS ABOUT THE EARTH

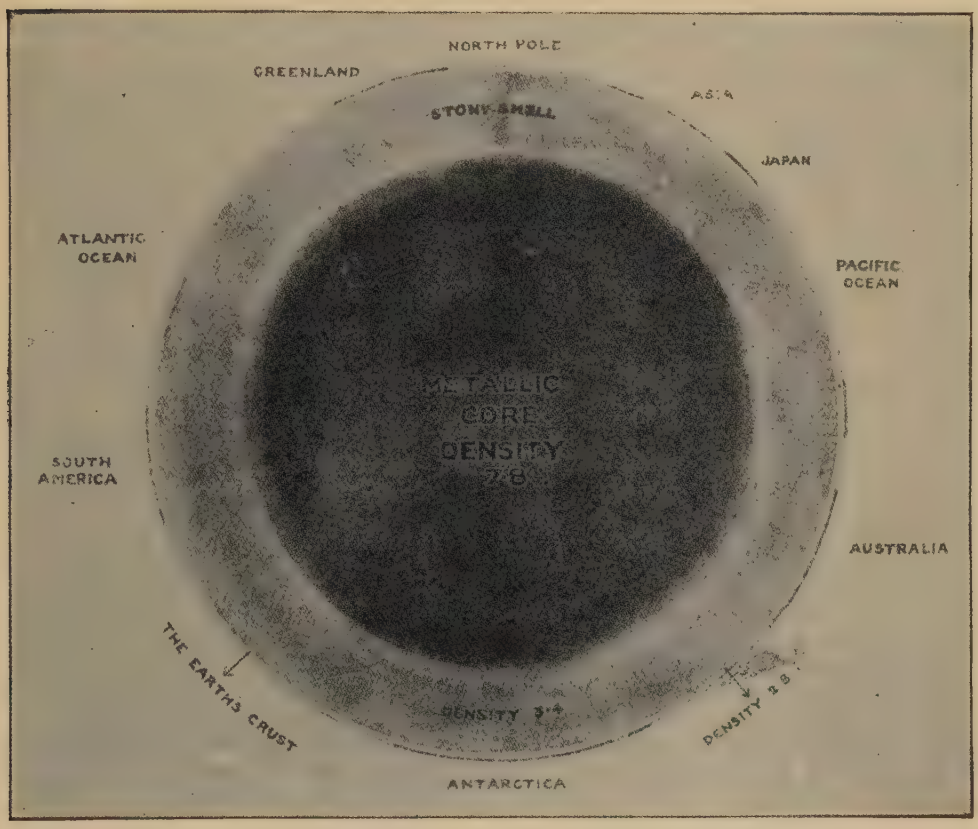
NUMEROUS ILLUSTRATIONS, CHARTS AND MAPS

Life Ages of the Earth	Pictorial Diagram Showing the Corresponding Forms of Animal and Plant Life, and Rock Strata in the Earth's Crust.	Rocks and Strata to which they belong	
Cenozoic, or Recent Life. Age of Mammals.		Alluvium Gravel, Mud, Sand, Clay, Marl, Limestone.	Cenozoic
Mesozoic, or Middle Life. Age of Reptiles.		Chalk, Gault, Green Sand, Oolite, Clays and Limestone, China Clay, Shales, Cement, Sandstone, Pervian.	Mesozoic
Paleozoic, or Old Life. Age of Invertebrates. Age of Fishes. Age of Acrogens.		Coal Massives, Upper and Lower. Millstone, Grit, Mountain, Limestone, Old Red Sand Stone, Iron Ore, Gypsum, Gas, Lead, Zinc, Phosphate, Marble, Sandstone, Shales, Copper.	Paleozoic
Proterozoic, or Earlier Life. Earliest Forms of Life.		Copper, Silver, Lake Superior Iron Ores, and many Metals. Granite, Schists. Emery, Gems, and Building Stone.	Proterozoic

1. Sivatherium, (*siv-a-thē'-ri-um*). 2. Mastodon, (*mas'tō-don*). 3. Elephas, (*el'e-fas*). 4. Palæotherium, (*pă-ē-ō-thē'-ri-um*). 5. Pterodactyl, (*ter-ō-dak'til*). 6. Ammonites, (*am'mo-nīlz*). 7. Plesiosaurus, (*plē-zi-ō-saw'rus*). 8. Ichthyosaurus, (*ik-thi-ō-saw'rus*). 9. Carboniferous, (*kăr'bŏn-if'ĕr-ŭs*) fern. 10. Lepidodendron, (*lep-i-dō-den'dron*). 11. Calamites, (*kal'a-mīts or kal'a-mi'ēz*). 12. Labyrinthodon, (*lab-i-rin'thō-don*). 13. Acanthodus, (*a-kan-thō'dus*). 14. Diplacanthus, (*dip-la-kan'thus*). 15. Lepidosteus, (*lep-i-dos'te-us*). 16. Climatius, (*cli-ma'ti-us*). 17. Zosterites, (*zos-ter-ī'tēz*). 18. Goniatites, (*go-ni-a-ti'tez*). 19. Strophomena, (*strō-phŏm'ĕ-na*).

BOOK OF THE EARTH

SCIENCE tells us that the Earth was once a shining star, a globe of liquid fire. As it cooled down, a crust formed over its surface, composed chiefly of rocks and metals. This crust was rent by the force of the gases shut up within, and thus the mountains, valleys, gorges, and volcanoes were formed. The Earth, indeed, is still upheaving and subsiding, but so slowly that we rarely feel it. Through these agencies the distribution of land and water on the surface of the earth has undergone great changes. The shape of the Earth is that of a *sphere* somewhat flattened at the poles, and it has a diameter of about 8,000 miles. The solid crust is called the *lithosphere*—which is surrounded by an envelope of air—the *atmosphere*—and in part by an envelope of water—the *hydrosphere*.



HOW THE EARTH WOULD APPEAR IF CUT THROUGH THE CENTER

Beneath the rocky crust of the earth, thirty-five miles in thickness, there is a broad belt of heavier material to a depth of nine hundred miles. Within this shell lies the great metallic core.

OUR EARTH: ITS STRUCTURE AND SURFACE

OUR first glimpse of the earth as a planet shows it as a nebulous star, still intensely hot, and with no solid nucleus, rotating on its own axis, and at the same time revolving around the sun in a nearly circular orbit.

WHAT THE HEAT OF THE EARTH SHOWS

At first it seems hardly possible that the earth could have been a star. But, if we go down beneath the surface of the earth, we find that at a depth of forty or fifty feet there is very slight variation in temperature. When we go yet deeper, as in mines, we find that the earth grows hotter as we descend. The temperature increases on an average about one degree Fahrenheit for every sixty-four feet descent. But this amount is variable according to the locality, geological

formation, and dip of strata. In the Calumet and Hecla Mine, observations show an increase of one degree in about every one hundred and twenty-five feet. At Paris, the water from a depth of 1794 feet has a temperature of eighty-two degrees; at Salzwerth, in Germany, from a depth of 2144 feet, a temperature of ninety-one degrees. Natural hot springs, rising from unknown depths, are sometimes scalding hot. One in Arkansas has a temperature of one hundred and eighty degrees.

At a depth of twenty miles, with this continual increase of temperature, the ground must be fully red-hot; and not very much farther down the heat must be sufficient to melt every known substance. The solid earth, then, is merely a thin crust, covering a sea of liquid fire below. The streams of lava poured forth from volcanoes are a proof of the existence of this molten mass beneath our feet.

WHAT CAUSES THE INTERNAL HEAT OF THE EARTH

If we examine the solid crust of the earth we shall not long be at a loss in regard to the origin of this internal heat. We are all familiar with the burning of coal. Now coal is mainly a substance called *carbon*, and when it burns it unites with *oxygen*, one of the gases in the air. Many rarer substances, such as silicon, and the metals magnesium, calcium, and sodium, are even more inflammable than carbon, and in burning give rise to solid products. Now the rocks in the earth are found to be made up almost wholly of these very inflammable substances combined with oxygen. The solid portions of the earth, then, are nothing but the ashes and cinders of a great conflagration. Even the waters are made up of hydrogen, one of the most inflammable substances, united with this same oxygen, and, strange as it may seem, they too, are the products of combustion. When, therefore, the materials of which the earth is formed were burning, our planet must have been a fiery star, and the great heat must have reduced all the products of the conflagration to a liquid state.

HOW THE EARTH'S CRUST WAS FORMED

When the fire went out for lack of fuel the mass began to cool at the surface, and a solid crust was finally formed, which with the lapse of time became thicker and thicker. This crust shut in the steam and gases generated in the fiery ocean underneath; and these, acting upon the crust with enormous pressure, heaved it into ridges. At times the strain caused the crust to crack, and forced the melted mass up through it, and in this way hills and mountains were formed. The thicker the crust the greater the strain it would bear before it gave way, and the greater the amount of molten matter driven out through the rent. The highest mountains, then, are the last that were uplifted. In some cases the openings thus made in the crust were never completely closed, and thus volcanoes were formed. These act like safety-valves, and prevent the forces within from accumulating sufficiently to cause fresh rents. But notwithstanding the relief thus given to the pent-up forces, they still manifest themselves in earthquakes.

SHAPE OF THE EARTH A SPHEROID

Like all other planets, the earth is a solid sphere that has undergone a slight flattening at the opposite extremities or poles of the axis of revolution. More accurately, it is an oblate spheroid generated by the rotation of an ellipse about its minor axis. Such a figure would be assumed by a sphere of liquid rotating about a diameter, centrifugal force acting most vigorously at the equator, and tending to overcome the internal forces that keep the molecules together.

SIZE AND DENSITY OF THE EARTH

The smallest diameter of the earth is that measured from pole to pole along the axis of rotation; this is 7,899.6 miles, or about 500,000,000 inches. The greatest diameters are those measured between opposite points on the equator; these are 7,926.6 miles, and, therefore, show that the eccentricity of the earth, or the extent of its departure from the perfect sphere, is very slight.

The circumference of the earth, measured along the equator, is 24,899 miles; the area is 197,000,000 square miles; and the volume is 260,000,000,000 cubic miles. Experiments on the comparative attraction of the earth show

that its density is about five and one-half times that of pure water. Its mass is, therefore, approximately six thousand trillion tons.

How we know the earth is a sphere

The ordinary proofs of the sphericity of the earth are: (1) It can be circumnavigated; (2) the appearance of a vessel at sea always indicates a nearer convexity of the earth's surface; (3) the sea-horizon is always depressed equally in all directions when viewed from an elevation; (4) the elevation of the pole star increases as we travel northwards from the equator; (5) the shadow of the earth on the moon during a lunar eclipse is spherical.

The rotation of the earth

The earth rotates uniformly about its axis. The time taken to make a complete revolution of three hundred and sixty degrees is called a sidereal day, for it is the interval of time between consecutive transits of any distant star across any meridian of the earth. The time between consecutive transits of the sun across any meridian is called a solar day; the average of these throughout the whole year is called a mean solar day, and is the practical standard of time adopted by civilized nations. The ordinary proofs that the earth rotates are: (1) Bodies falling from a great height have an easterly deviation; (2) Foucault's pendulum experiment; (3) a gyroscope delicately balanced so as to be free to change the direction of its axis in any way will, if rotated, exhibit an apparent deviation; (4) in northern hemispheres a projectile deviates to the right, in southern hemispheres to the left; (5) the trade winds; (6) Dove's law of wind-change.

The speed of a body on the equator, due to the diurnal rotation, is about 1,000 miles an hour. The centrifugal force due to this speed diminishes the weight of bodies; if the earth rotated in an hour, they would be thrown off from the surface at the equator.

The axis of the earth is not perpendicular to the ecliptic, but at angle of 66° 32′ to it; the equator is, therefore, inclined to it at an angle of 23° 28′. This unsymmetrical placing of the bulging portions of the earth causes a slow wobbling, or precession of its axis, in the same sort of way as a spinning top will wobble when pushed over on one side. There is also a slight vibration or "nodding" motion of the earth's axis, known as nutation. The period of each precession is about twenty-one thousand years; if the earth's orbit occupied a constant position in its plane, the periods would be twenty-six thousand years each. These motions have considerable influence on climate, the modern theories of the Ice Age being connected with the known facts of precessional motion.

The earth a series of shells of matter

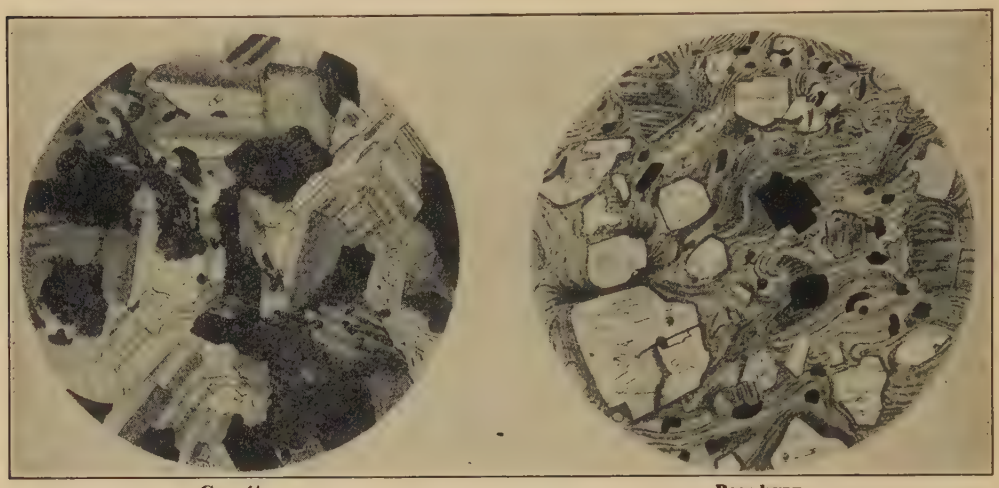
The great bulk of the earth consists of the *lithosphere*, or solid globe of rocks, with which geology properly deals. It is on the part of this lithosphere, composing a little more than a quarter of the earth's whole area—55,500,000 square miles—which rises above the seas and is called land, that mankind lives.

The central core is a globe of about 7600 miles in diameter, which is composed of iron and other elements, probably not forming compounds, in the gaseous state, but exposed to such tremendous pressure that it behaves as a solid and extremely rigid body. Outside this core is a shell of liquid matter which consists of all the rocks which we know at the surface in a state of fusion, perhaps one hundred miles in thickness. Upon this magma floats the solid crust, thirty or forty miles thick, which is composed of various rocks, breaking down at the surface into soil. Three-fourths of the surface of this crust are covered by the water of the oceans, the hydrosphere, the rest being dry land. Outside all comes the atmospheric mantle, chiefly composed of air, which supports life, acts as a blanket to keep the earth warm, and as a shield against the blows of meteorites.

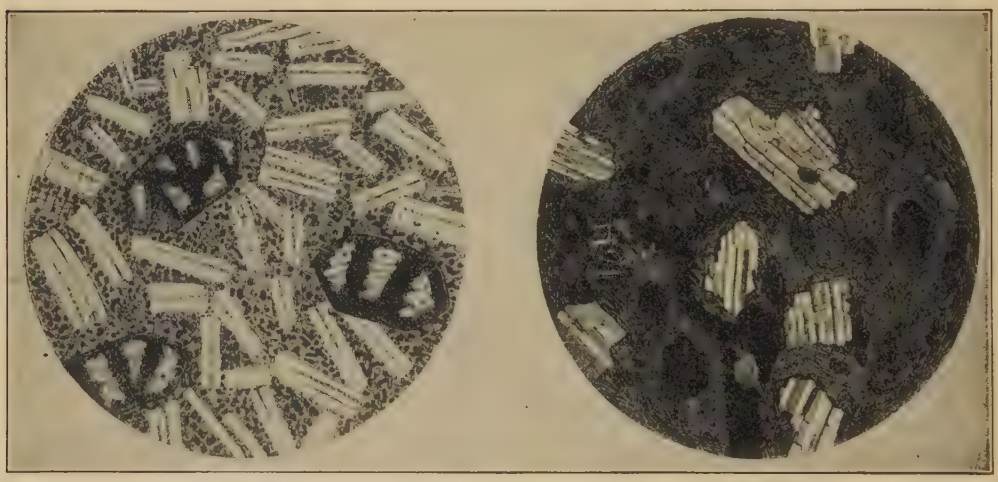
How the earth's crust is constructed

An examination of the Earth's crust shows us that it is constructed of numerous strata of rocks, some of limestone, some of sandstone, and some of clay; and some are very hard, others soft and crumbling, and readily worn away by the action of running streams or the waves of the ocean. To these several substances which form the materials of the earth's crust we give the name *rock*.

Hence we see that while in ordinary language the word rock denotes a great mass of hard stone, in geology a rock is any mass of natural substance forming part of the earth's crust. In this sense, loose sand, gravel, and soft clay are as much rocks as hard limestone and granite.



Granite Porphyry



Basalt Hornblende

COMPOSITION AND TEXTURE OF STONE AS REVEALED BY THE MICROSCOPE

MATERIALS OF WHICH ROCKS ARE COMPOSED

Rocks are formed of various materials called minerals. If we take a piece of sandstone rock, or a piece of granite, we shall probably be able to notice that the rock is made up of different substances.

On looking at a piece of *sandstone*, for example, especially if we use a magnifying glass, we see that it is composed of little rounded grains of a glassy-looking substance cemented together. In some specimens these grains are larger than in others. This cementing material is not the same in all sandstones, but in our specimen it is formed of *calcium carbonate*, for when we drop a little diluted hydrochloric acid on the rock there is an effervescence. The cementing material is dissolved, but the little rounded grains, which consist of *quartz*, are not affected by the acid. The sandstone, then, consists of quartz grains cemented together by calcium carbonate. It is called a calcareous sandstone.

Now take a piece of granite, and break it with a hammer to get a clean-cut face.

On looking at this face we see that the rock is made up of *three* different substances.

One of these has a glassy appearance like the grains in the sandstone, and is so hard that we cannot scratch it with a knife. This is *quartz*. Another of the substances is of a dull white or pinkish color. It lies in long, smooth-faced crystalline patches, which easily break along a number of smooth parallel surfaces having a pearly lustre. It can be scratched with difficulty by the point of a knife. This substance is called *felspar*. The third substance consists of bright glistening plates, sometimes of a dark color, which can be easily scratched, and which readily split into transparent leaves. This is *mica*. Notice that these substances do not occur in any definite order, but are scattered about through the stone irregularly, the felspar occurring in some specimens in larger crystals than in others.

What a Mineral Is

Hence we see that granite consists of a mixture of three substances, called quartz, felspar, and mica, the felspar being in greatest quantity. Each of these substances possesses properties more or less peculiar to itself, such as hardness, solubility in acids, specific gravity, crystalline form, way of splitting, etc. Hence, each of these substances has a *definite chemical composition and constant physical properties* which define them as *minerals*.

This definition may be understood to include such substances as coal and chalk, which are the mineralized remains of plants and animals respectively. Even water and gases of the atmosphere may be said to belong to the mineral kingdom of nature, as plants and their parts are said to belong to the vegetable kingdom, and animals and their parts to the animal kingdom.

Chief Rock-Forming Minerals

The total number of rock-forming minerals is very large, but many of them are very rare, and form but a very small part of the earth's crust.

The most abundant materials or earths of which rocks are composed are *silica*, *lime* and *aluminum*. Silica or flint is very universally diffused. It is found almost pure in quartz, opal, chalcedony, rock crystal, and the flinty sand of the sea-shore. Lime is also a very generally distributed earth, and is usually found in the form of carbonate. Under the several names of marl, limestone, ŏolite, and chalk it constitutes mountains, and even ranges of mountains. Aluminum is likewise very abundant, and of great importance to mankind. It enters largely into the clayey or argillaceous earths, and forms part of various kinds of rock which possess the property of not permitting water to pass through its substance—a property which renders it of inestimable value both for natural and artificial reservoirs of water.

Chief Chemical Elements Which Form Minerals

The larger number of elements play so small a part in the constitution of the earth that they may be neglected by the geologist. The following list includes the elements of which ninety-nine per cent of the earth's crust, as known to us, is composed, with their relative proportions, as indicated by Clarke's laborious analyses of a very large number of typical rocks:

Element	Chemical Symbol	Percentage of Earth's Crust Which It Forms
Oxygen	O	47.02
Silicon	Si	28.06
Aluminum	Al	8.16
Iron	Fe	4.64
Calcium	Ca	3.50
Magnesium	Mg	2.62
Sodium	Na	2.63
Potassium	K	2.32
Hydrogen	H	0.17
Carbon	C	0.12
		99.24

The ten elements given above form 99.24 of the earth's solid crust.

How Rocks Are Classified

The beds or layers which form the crust of the earth are divided into three classes: (1) *Sedimentary*, or stratified; (2) *Igneous*, or unstratified; (3) *Metamorphic*, or transformed.

Sedimentary or Stratified Rocks

Sedimentary rocks are such as give evidence of having been formed by successive deposits of sediment in water. They include sandstones or freestones, limestones, clays, etc. The material for these must have been derived from some original source, and in many instances

this may be traced to the disintegration of older rocks. Thus gneiss appears to be formed by the disintegration of granite. The great class of sedimentary rocks may be divided into three smaller divisions. These divisions, with the chief rocks of each division, may be tabulated as follows:

(a) Mechanically formed rocks from detrital sediments: Conglomerates, sandstones, clay, and shale.

(b) Organically formed rocks from animal and plant remains: Limestones, chalk, coral, peat, and coal.

(c) Chemically formed rocks from material once in solution: Limestones, stalactites, gypsum, rock-salt and sinter.

Most of the stratified rocks contain fossils; and since each group contains certain kinds peculiar to itself, it is by means of these organic remains that their relative ages have been determined.

Although the lowest stratified rocks are more ancient than those which have been deposited above them, the layers or beds do not always retain a horizontal position. Were such the case, it could only be by deep cuttings that we should arrive at the older strata. We however find that, owing to some convulsion of nature, stratified rocks have been thrown out of their original position, and thus crop out to the surface. Not only is facility thus afforded us to become acquainted with the nature of the lower rocks, but many of the most valuable products of the earth are by this means rendered accessible to man.

The greater number of these beds contain organic remains, i. e., the remains of

HOW THE HISTORY OF THE EARTH IS EMBEDDED IN THE ROCKS

A million years ago, a little stream trickled down a mountain-side, carrying with it grains of sand and stones which fell to the bottom of the sea. In the sea swam a great and wonderful creature called an ichthyosaurus. One day the great creature died, or probably it was killed in battle with another strange monster, and its body fell to the bottom of the sea among the shells and seaweed. Meanwhile, the stones and sand brought down by the stream continued to fall upon the bed of the sea until at last the great reptile's body was buried, and the lower layers became pressed into hard rock by the weight on top. One day an elephant going to the river to drink broke off his tusk, and this was carried down by the river and sank in the sea. Another day a bird was drowned, and this, too, fell upon the ocean-bed. Dead fishes and shells also sank, and all were buried by the never-ceasing shower of mud and earth and sand and stones. Ages after the ichthyosaurus died, men began to live on the earth, and one day a man who had made a boat went out to fish. Trying to spear a big fish, the head of his harpoon broke off and fell to the bottom of the sea. In course of time this also was buried in the mud. The bottom of the sea crept higher and higher, till at last it became dry land. Then one day men began to dig, and the world's wonderful story was revealed as we read it here. First the spear-head was found, then the tusk, the bird's skeleton, the shells, the fish, and at last the skeleton of the great sea reptile, all turned to stone and become *fossils*, a word that means "something dug up."

animals and plants, which are termed fossils. Among these the most numerous are the remains of marine animals, and in some instances shells and corals occur in such abundance as to form the principal part of extensive beds. Every part of the earth exhibits similar, or nearly similar formations; and not only are marine fossils met with in the interior of continents, and at great elevations above the sea, but a vast variety of plants, corals, shells, fish, reptiles, etc., are found, of species dissimilar to any at present on the land or in the waters. Besides rocks, we meet with earthy formations on the surface. These include such loose materials as are disintegrated or worn away from rocks, and form, when combined with decayed animal and vegetable matter, the soil of meadows and arable lands.

Igneous, or Unstratified Rocks are such as appear to be of igneous origin, or to have been formed by the action of fire or intense heat. They are called unstratified, because instead of having been deposited in successive layers, like the stratified rocks, they seem to have been formed by the fusion or melting of the materials of which they are composed, and the subsequent cooling and hardening of the melted matter into one great mass. Granite, basalt, lava, etc., are examples of this class of rocks, and represent respectively the sub-classes of plutonic, trap, and volcanic rocks. Plutonic rocks are those which have cooled under the pressure of overlying rocks; trap rocks, those which have cooled under that of deep water; and volcanic rocks, such as have cooled in the air.

Though granite is the most useful of the igneous rocks, basalt is probably the most interesting because of the wonderful formations it discloses. It is a dense basic lava of a dark color, that breaks with a conchoidal or shell-like fracture, and shows a finely grained or hemicrystalline texture in a glassy base. The basalt rocks are found both as intrusive masses and as sheets that have been poured out on the surface. Many of these lava sheets of basalt in slowly cooling and solidifying acquired a columnar structure, the columns often having a more or less hexagonal shape, though the number of sides varies. Fine examples of these columnar basalts accur at Fingal's cave in the island of Staffa, at the Giant's Causeway in the north of Ireland, and on the shores of Lake Superior.

Metamorphic, or Transformed rocks, include altered rocks of either sedimentary or igneous origin, in which the acquired are more prominent than the original characteristics. Igneous rocks have, in many cases, forced their way up through stratified rocks. These igneous formations, while still in a molten state, in coming in contact with the aqueous or stratified rocks, have usually changed the character of those portions immediately near them. The chief changes of structure effected by metamorphic action are crystallization and foliation. Examples of metamorphic rocks are marble, quartzite, slate, gneiss, and the schists.

How the Metals are Found

In some localities fissures in rocks are found to contain metallic substances. Such fissures are frequently found partially filled with calcareous spar which forms the matrix in which the metals are inclosed.

Metallic veins are supposed to be partially filled by mechanical means, the particles of metallic substances being conveyed into them by the action of water or some other power, and partly by chemical action, or by sublimation or fumes rising from below.

Some metallic deposits appear to occur in situations where igneous rocks have intruded themselves. Gold is supposed to be found almost invariably under such circumstances. Such appears to be the case in the rich deposits near the Ural mountains, and also in California and in Australia. In all these places it is met with in quartz. It is in pebbles or sand of the same rock that it occurs in the beds of rivers, and in some cases is found spread over a large extent of country.

Copper, though frequently met with in veins, is also found in extensive masses or beds, interposed between layers of rock. The same remark applies to tin, lead, and silver. Iron is also met with in beds, and also in nodules or rounded masses, which occur in great abundance among some kinds of rock. The last-named is the most universally diffused of all metals, and the most useful.

A GEOLOGICAL VIEW OF THE GROWTH OF THE EARTH

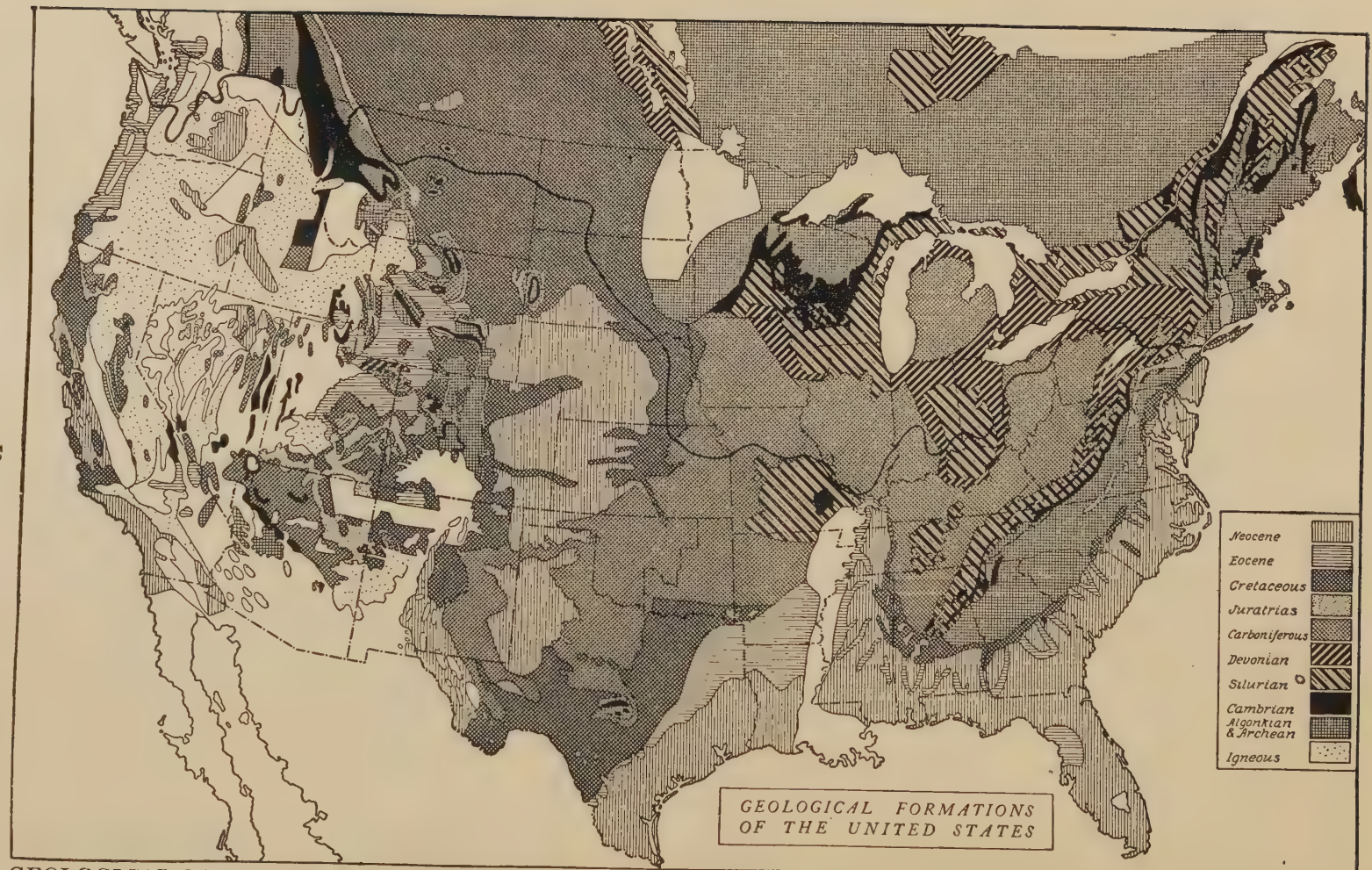
Giving the geological ages, rock systems, strata and the development of life, with their relative positions and order of succession, according to the latest scientific knowledge. Many attempts have been made to compute from geological, physical, and other data the length of the period during which the earth has been in a solid state.

Geologists, however, are disinclined to accept any period much less than 100,000,000 years as sufficient for the elaboration of the present structure of the earth. It is indisputable that many millions of years, probably thirty or forty, must have elapsed while the great sedimentary rocks were being deposited. With respect to the larger features of the earth's surface, it is likely that two different kinds of movement are responsible. Where the contraction of the earth has caused a lessening of the support below the surface, there has been a subsidence of great areas. In the second place, where the rigid crust has been able to contract into a smaller space, great mountain ridges and folds have been formed. The subsidences which caused the ocean took place at different ages. The Atlantic Ocean probably dates from middle Cenozoic times; the Indian Ocean may be older; the Pacific suffered great modifications in comparatively recent times.

Life Ages of the Earth	Rock Systems	Series of Rock Strata	Characteristic Rocks	Forms of Life	Chief Economic Products
Cenozoic (*se'nŏ-zō'ĭk*), or "Recent life." *Estimated Age of Period*, **3,000,000** *years.*	**Quaternary** (*kwa-ter'na-ri*) or "fourth." Once supposed to be the *fourth* sedimentary system. Age of man.	Recent, or Human.	Alluvium, sand, gravel, mud, clay, marl, loess.	Man predominant.	Clay, peat, bog iron ore, marl, gold placers.
		Pleistocene (*plīs'tō-sēn*), or "most recent." Glacial Period.	Drift, boulder clay, gravel, loess, silt, glacial deposits and other formations formed during glacial period.	Mammoth, mastodon, bear, bison, reindeer, musk-ox. Possibly man was living but that is uncertain.	Clay, gravel, gold placers.
		Pliocene (*plī'ō-sēn*), or "more recent."	In East and West, land deposits predominate. Marine sands, clays, marls on Atlantic and Pacific coasts. Igneous rocks in West.	Plants and animals much as today, aside from human and domestic species.	Gold (in part placers), coal, oil, gas.
	Tertiary (*ter'-shi-a-ri*), or "third." Once supposed to be the *third* sedimentary system, or Age of mammals.	**Miocene** (*mī'ō-sēn*) or "less recent."	On Atlantic coast; sand, clay, shell marl, diatomaceous earth. In West; sandstone, shale and diatomaceous material. Extensive volcanic formations in Rocky Mountains and Great Basin region.	Land animals include elephants, camels, deer, oxen, horses, true apes, etc. Marine animals much like those today. Among plants, grasses become important; deciduous trees increase.	Silver, gold, coal, oil, gas, phosphate rock, diatomaceous earth.
		Oligocene (*ŏl'-ĭ-gō-sēn*), or "a little more recent."	Limestone in Caribbean region, land deposits in West. Marine and fresh water beds on west coast. Many coal beds in Puget Sound.	Ancient dogs, cats, rabbits, squirrels, camels and horses were represented.	Copper, silver.
		Eocene (*ē'-ō-sēn*), or "dawn of recent."	In Eastern States: clays, sands, greensand, marls. In West: conglomerate, sandstone, shale, diatomaceous shale and igneous formations are developed. Many coal beds in Puget Sound. Fresh water beds in western interior.	Mammals flourished, including rodentia, carnivera, edentates, lemuroids, birds, reptiles, etc. Flora included figs, palms, bananas, willows, chestnuts, oaks, etc.	Gold, zinc, lead, coal, oil, gas.
Mesozoic (*mĕs-ō-zo'-ĭc*), or "Middle life," *Estimated Age of Period*, **9,000,000** *years.*	**Cretaceous** (*krē-tā'she-us*) or "bearing chalk."	Upper.	In East: sand, clay, and greensand marl. In West: sandstone, shale, limestone, chalk, extensive coal beds, various igneous rocks.	Reptiles predominate; turtles, lizards, crocodiles, flying reptiles, etc. Many waterbirds. Angiosperms predominate; larch, beech, walnut, tulip trees, etc.	Coal, oil, gas, copper, gold, china clay, fire clay, cement building stone.
		Lower	Clay, sand, gravel on Atlantic coast and Gulf. Sedimentary and igneous rocks on west coast. Some nonmarine beds in Texas.	Reptiles abound. Flora includes cycadeous, conifers, horsetails; angiosperms appear.	
	Jurassic (*jŏŏ-ras'sik*) or like the mass of the Jura Mountains. Age of Reptiles.	Upper. Middle. Lower.	Probably not represented in East. Sandstones, limestones and shales in West. Some "red beds" in western interior.	Ammonites, belemites continue in great variety. Reptiles numerous and varied types. Flying reptiles and reptile-like birds appear.	Oil, gold.
	Triassic (*trĭ-ăs'ĭk*), or in a triple series.	Upper. Middle Lower.	In East sediments formed in shallow troughs between recently formed mountains. Considerable bodies of igneous rock, traps and other flows and dikes. "Red beds" in West with salt and gypsum. Some igneous rocks on west coast.	Reptiles of enormous size dominate the land and sea. Mammals appear; Ammonites and belemites dominate invertebrate life.	Salt, gypsum, a little coal in Virginia, copper, building stone.

A GEOLOGICAL VIEW OF THE GROWTH OF THE EARTH—Continued

Life Ages of the Earth	Rock Systems	Series of Rock Strata	Characteristic Rocks	Forms of Life	Chief Economic Products
Paleozoic (*pāl-ē-ō-zō'ic*), or "Old life." *Estimated Age of Period*, **24,000,000** *years.*	**Carboniferous** (*kăr-bŏn-if'-er-us*), or coal-bearing. Age of Amphibians.	**Permian** (*per'-mē-ăn*), like those at Perm, Russia.	In east fresh water sediments including coal; in West "red beds" probably of continental origin. Some marine sediments; salt and gypsum in red beds in Kansas.	Reptiles become prominent in number and variety; inhabit fresh water, salt water and land.	Salt and gypsum; some coal in Eastern States.
		Pennsylvanian, like those of Pennsylvania.	In Eastern States grits, sandstones, shales, limestone and coal. In Western States much limestone; no coal. Igneous rocks on west coast.	Plants abound; Marked development of land animals, including insects, spiders and scorpions. Lizards become important. Amphibians reach climax.	Coal, oil, gas, iron ore, fire clay, phosphate rock.
		Mississippian, or Lower Carboniferous.	Limestones predominate with sandstones near base and shales near top of series. Igneous rocks in California.	Crinoids greatly developed. Amphibians appear. Plant life expands.	Oil, gas, lead, zinc, building stone, cement rock.
	Devonian (*de-vō'ni-an*) like those of Devonshire, England. Age Fishes.	Upper. Middle. Lower.	Sedimentary rocks, limestones, sandstones shales; igneous rocks in Maine, Nova Scotia and New Brunswick.	Rapid changes in animal kingdom; shifting habitat; extensive development of fishes; sharks flourish. Plants are mainly small leaf and reed types.	Gas, oil, iron ore, phosphate rock.
	Silurian (*si-lū'ri-an*), in the land of the Silures, England. Age of Invertebrates.	**Ontarian** (*on-tā'rē-ăn*), place name. **Champlainian** (*shăm-plān'ē-ăn*), place name.	Sedimentary rocks predominate; conglomerates, sandstones, shales, limestones, salt, gypsum. Igneous rocks in Nova Scotia, New Brunswick and Maine.	Vertebrates appear; low forms of fishes. First reef building corals. Crinoids and brachiopods, important Cephalopods continue to dominate.	Iron ore, gas, salt, gypsum, cement rock.
	Ordovician (*ŏr-dō-vīsh'ăn*) a place name in Wales.	**Cincinnatian** (*sĭn-sĭn-năt'-ē ăn*), place name. **Mohawkian** (*mō-hŏk'ē-an*), place name. Lower.	Chiefly limestone with subordinate sandstone and shale. Rocks greatly folded in New York, in Taconic Mountain region.	Much as in the Cambrian. Remains are more abundant. Species more numerous; insects were present. Vertebrates appear. Low forms fishes. Trilobites reach climax.	Oil, gas, lead, zinc, phosphate rock, manganese, marble.
	Cambrian (*kam'-bri-an*), from Cambria, the old name for Wales.	**Saratogan** (*săr-ā-tō'găn*), place name. **Acadian** (*ā-kā'dē-ăn*), place name. **Georgian** (*jō'rgē-ăn*), place name.	Mainly sandstones with some shales, and in Western States considerable limestone. At some places rocks are changed by pressure, especially in the Appalachian Mountains. Upper Cambrian covered larger area than lower Cambrian.	All great divisions of animal kingdom except vertebrates are represented; trilobites, brachiopods, sponges, graptolites, etc. Little evidence of vegetation, but it must have abounded as food for animals.	Lead, zinc, barite, copper.
Proterozoic (*prō-ter-ō-zō'ic*), "Former life." *Estimated Age of Period*, **18,000,000** *years.*	**Algonkian** (*ăl-gŏn'kē-ăn*) from district of Algonquin Indians, north of St. Lawrence.	**Keweenawan**[1] (*kē'wē-năh-wăn*) pertaining to Keweenaw Peninsula, Michigan.	A great series of sandstones, limestones and shales, in middle portion of which are many enormous flows of lava.	Fossils rare or wanting.	Copper, silver.
		Huronian (*hu-rō'nē-ăn,*) rocks on borders of Lake Huron.	Three great series of sedimentary rocks, sandstone, shale, and limestone, and iron formation. Contains also many great igneous bodies, acidic and basic. Lower members much metomorphosed by pressure.	Rocks contain clear evidence of low forms of life.	Principal iron ores of Lake Superior region; also copper, nickel, silver, cobalt, gold. Building stone and ornamental stone.
Archeozoic (*ar'kē-o-zō'ic*), "Without life." *Estimated Age of Period* **18,000,000** *years.*	**Archean** (*ăr-kē'ăn*), "oldest."	**Laurentian** (*law-ren'shi-an*), pertaining to rocks along the St. Lawrence River.	Granitic rocks and gneisses that are believed to be granitic rocks metamorphosed by pressure. Formerly supposed to be older than Keewatin and regarded the "original crust of the earth."	Since the rocks are of igneous origin, they contain no organic remains.	Iron ores, precious metals, gems, apatite, rare earths, graphite, asbestos.
		Keewatin (*kē-wä'tin*), rocks in a district of Manitoba, Canada.	A great schist series made up of lava flows, tuffs, and volcanic ashes. With these are subordinate sedimentary rocks; sandstone, shale, limestone, and iron ore formations nearly everywhere greatly metamorphosed by pressure. Includes the oldest rocks known.	No fossils found, but carbonaceous schists and limestones are believed to indicate the presence of life.	Emery, building and ornamental stones.



GEOLOGICAL MAP OF THE UNITED STATES SHOWING THE REGIONS OF REPRESENTATIVE FORMATIONS

MAP SHOWING THE DISTRIBUTION OF LAND AND WATER

LAND FORMS OF THE WORLD

The proportion of land to water upon the earth is as 27 to 72, or roughly *one-fourth* to *three-fourths;* the land covering fifty-three million square miles, the sea one hundred and forty-four million. The land consists of six great bodies called continents, and a multitude of small fragments called islands, which skirt the shores of the continents or dot the broad expanse of the sea.

THE DISTRIBUTION OF LAND AND WATER

By far the greatest proportion of land is in the northern hemisphere, and in temperate latitudes. Broadly speaking, the northern hemisphere is the hemisphere of land, and the southern hemisphere is the hemisphere of ocean. The earth could be bisected in such a way that one hemisphere contained almost no land, while the other was composed almost equally of land and water.

LOCATION OF THE CONTINENTS

The greater part of the land on the earth's surface is grouped into two great *hemispheres,* the Old and the New World. The former and far larger of these consists of Eurasia in the north, separated by ill-defined boundaries from Europe to the west and Asia to the east, and of Africa in the south, united to Eurasia by the narrow neck of the isthmus of Suez. The hemisphere of the New World is divided into North America and South America, united by the long, narrow isthmus of Central America. The island of Australia is also reckoned as a continent. It is believed that an island continent, Antarctica, surrounds the South Pole. Of islands not reckoned as continents, the largest is the polar island of Greenland.

CERTAIN RESEMBLANCES OF THE CONTINENTS

In comparing the continents, we at once notice certain resemblances. The first is the tapering to the south, which is seen in Greenland, North and South America, Africa, and Australia (Tasmania). Another is the southward-running peninsulas which characterize Europe and Asia. We may notice, too, that the general lines of the Old World, broad in the north, tapering in the south, resemble those of the New World, especially if we include Australia (Tasmania), and compare its position with that of South America. There is also a certain uniformity in the distribution of

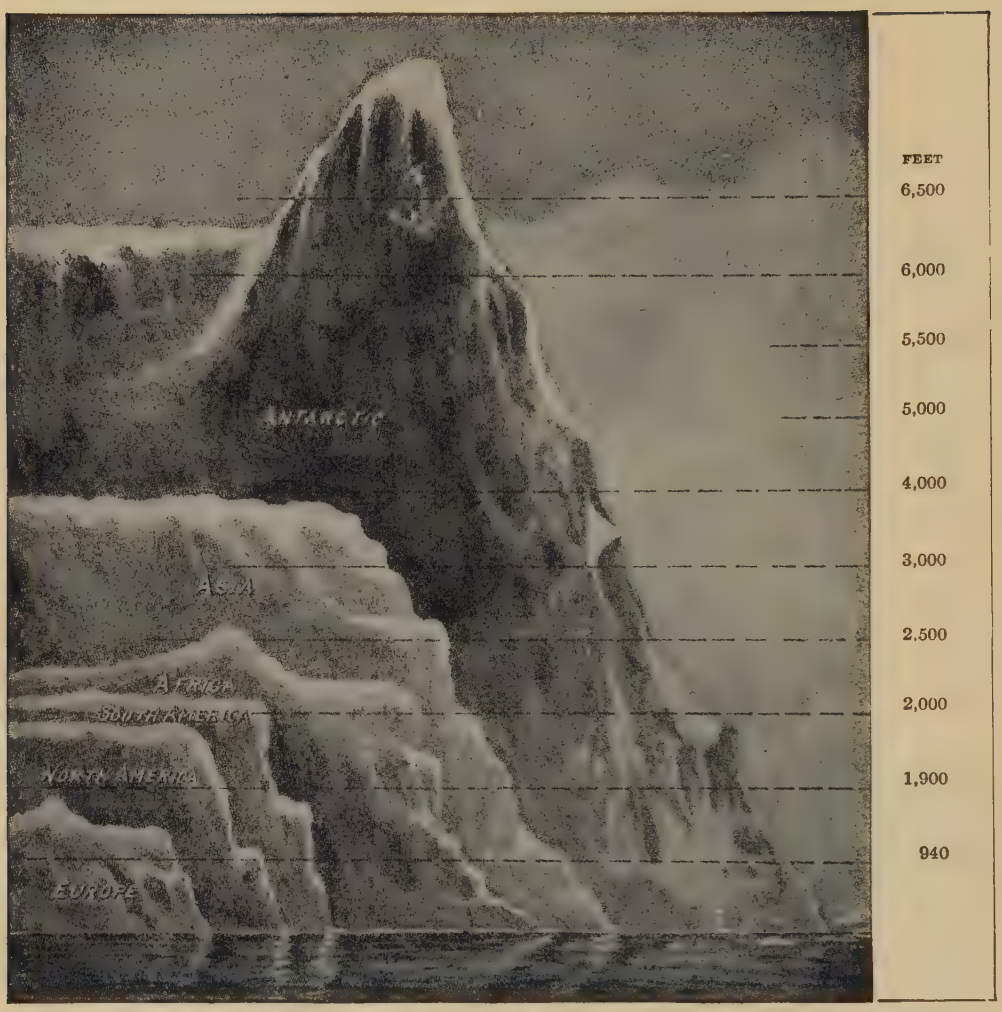


DIAGRAM SHOWING AVERAGE HEIGHT OF THE CONTINENTS

COMPARISON OF THE CONTINENTS

Continent	Asia	Africa	North America	South America	Europe	Australia	All Land
Area (million square miles)....	16.4	11.1	7.6	6.8	3.7	3.0	55.0
Average Height (feet).....	3,000	2,500	1,900	2,000	940	800	2,100
Heighest Point (feet).....	29,000	18,800	18,200	22,400	18,500	7,200	29,000
PERCENTAGE AT VARIOUS ALTITUDES (feet)							
Below Sea-Level.....	1.4	0.1	0.05	0.0	1.8	0.0	0.6
0 to 600 feet.....	23.3	12.5	32.25	40.0	53.8	29.8	26.7
600 to 1,500 feet.....	16.0	34.8	32.1	26.8	27.0	64.3	27.8
1,500 to 3,000 feet.....	21.7	27.6	13.3	16.8	10.0	4.1	19.3
3,000 to 6,000 feet.....	21.8	21.8	13.2	7.0	5.5	1.5	17.0
6,000 to 12,000 feet.....	10.0	2.8	8.4	5.0	1.7	0.3	6.0
Above 12,000 feet.....	5.8	0.4	0.7	4.4	0.2	0.0	2.6

relief. Notice the so-called Mid-World and Pacific Mountain systems, which may be traced in the mountains of Central Europe, North Africa, Central Asia, the islands of the Pacific from Japan to New Guinea, and the lofty mountains of North Central, and South America.

THE SHAPING OF THE COAST

The coast line, or margin of sea and land, is an area rapidly wearing away under the ceaseless influence of the waves, and of the sand and rock, they are perpetually hurling to and fro. Coasts may be either flat or high, composed either of hard or soft rock, and either submerged or raised. A submerged coast is one where the land has sunk or the sea has risen, so that the low grounds and valleys are flooded. A raised coast is one where the land has risen or the sea has retired, and what was formerly the sea bottom is bared.

A flat coast is usually sandy, often bordered by sandhills and lagoons. It may be carved into cliffs, as in the clay cliffs of Norfolk, England. A raised coast is usually flat from the long-continued action of the waves during the period when it was submerged. Flat coasts have no good harbors.

A submerged coast differs according to the nature of the submerged region. If this was hilly or mountainous, with valleys running parallel to the shore, the coast will be ironbound and harborless unless the sea-level has risen sufficiently to give access to the valleys behind the first range of heights. If this happens, T-shaped gulfs are formed. Where the valleys open at right angles to the sea, they become bays, usually with excellent harbors. The hills between the valleys rise as peninsulas, or islands. If the land was flat before submerging took place, a flat coast is the result.

Where the land is composed of soft rocks, a more uniform coast-line results than where it is composed of harder rocks, or of hard and soft rocks mixed. The waves, in eating out the softer rocks, often form magnificent sea-caves, natural arches, and pinnacles.

THE COASTLINE OF THE VARIOUS CONTINENTS

EUROPE surpasses all the other continents in the magnitude of its indentations and projections. Three great peninsulas—the Balkan peninsula, Italy, and Spain, project into the Mediterranean; while Britanny, Denmark, and Scandinavia jut into the shores of the Atlantic. Even the British Isles are scarcely more than a projection of the continent.

ASIA is second in the relative extent of its peninsulas. Asia Minor on the west, Arabia, India, and Indo-China on the south, and China, Manchuria with Corea and Kamchatka, advancing into the waters of the Pacific, form a wide border of projecting lands, containing the richest regions of the continent.

NORTH AMERICA is considerably less indented. Florida, Nova Scotia and Labrador are more prominent on the Atlantic coast, and California Peninsula and Alaska on the Pacific.

The southern continents on the contrary, are nowhere deeply penetrated by the waters of the ocean. The Gulf of Arica in South America, the Gulf of Guinea in Africa, and the Great Australian Bight, are merely gentle bends in the coast line.

LOCATION OF THE GREAT PLAINS OF THE WORLD

Plains occupy nearly one-half of the surface of the continents. They are most extensive and unbroken on the Arctic slopes of the Old World, and in the interior of the two Americas.

Treeless plains, whose vegetation consists of grasses and other herbaceous plants, or stunted shrubs, occur in every continent, and are designated by a variety of terms. Wherever treeless plains are subject to periodical rains, they lose their verdure in the season of drought, and assume the aspect of a desert; but they resume their freshness on the return of the rain, and many are adorned with a great variety of beautiful flowers.

PLAINS OF THE OLD WORLD. The great Siberian plain extends from the northeastern extremity of Asia to the Ural Mountains and Caspian Sea; and the European plain stretches from the Ural westward, through Russia and North Germany, to the lowlands of Holland.

The plains of the Caspian Sea and western Siberia are dreary steppes, covered with coarse grasses, often growing in tufts, alternating with patches of

heather, furze, dwarf birch, and other stunted shrubs; or old sea bottom, covered with salt efflorescence. Immense reaches of flat country, near the Arctic shores of Asia and Europe, consist of frozen marshes, called tundras, where mosses and lichens are almost the only vegetation. Those of eastern Europe and Asia are denominated steppes; while more limited treeless regions in western Europe are called landes and heaths.

On the alluvial plains of the Old World, civilization began and developed; and their inexhaustible fertility supplied the wants of the most populous nations of antiquity. The great centers of ancient civilization in Egypt, China, India and Babylonia, all had their growth in alluvial plains, built up and fertilized by the mighty rivers which traverse those countries.

Plains of the New World. In North America the great *Central Plain* extends, with but slight interruptions, from the Arctic shores to the Gulf of Mexico. The fertile, treeless plains are termed "prairies" (meadows), while the sterile ones, east of the Rocky Mountains, are known as "the plains." There are vast cane fields and forests in the lower Mississippi Valley.

In South America the plains of the Orinoco basin, the *Selvas* of the Amazon, and the *Pampas* of the La Plata, form an uninterrupted series of lowlands which, continued by the plains of Patagonia to the southern extremity of the continent, extend over a distance of three thousand five hundred miles from north to south. The Spanish term "llano" (plain), and the Peruvian "pampa," designate the treeless plains of the Orinoco and La Plata basins. The Llanos of the Orinoco, during one-half of the year are covered by the richest pasturage, bright with flowers, but during the other half are a parched waste. The Selvas of the Amazon, a luxuriant forest, cover more than a million square miles; and the treeless Pampas, with their tall grasses and thickets of clover and thistles, illustrate the endless richness and variety of nature.

Alluvial and marine plains generally have but a slight altitude, while the undulating plains are sometimes considerably elevated. The Mississippi Valley, at St. Louis, one thousand miles from the ocean, is hardly four hundred feet above the sea-level; and the Amazon, at an equal distance from the sea, does not reach two hundred and fifty feet. The marine plains adjacent to the Caspian and Aral seas are still lower, the larger portion being below the sea-level.

Situation, Elevation and Soil of Plateaus

Plateaus are situated either between two lofty mountain chains, which form their margins, or descend by successive terraces to the nearest seas; or they pass, by gradations, from the base of high mountains to the low plains in the interior of the continents.

The Great American Basin, between the Rocky and Sierra Nevada Mountains, and the plateau of Tibet, between the Himalaya and Kuenlun mountains, are examples of the first position; and the table-land of Mexico, of the second. The third is seen in the high plains at the eastern foot of the Rocky Mountains, which descend from an altitude of five thousand or six thousand feet, at the foot of the mountains, to the low plains of the Mississippi basin.

The plateaus most remarkable for their elevation are, Tibet, from ten thousand to eighteen thousand feet above the sea; and the elongated valley-like highlands, from ten thousand to thirteen thousand feet high, between the two chains of the Andes, in South America. East Turkestan and Mongolia, in central Asia; the plateau of Iran, in western Asia; Abyssinia, and the vast plateau which occupies all the southern part of Africa; and the broad table-land which fills the western half of North America with a continuous mass of high land, range in height from four thousand to eight thousand feet.

The great peninsulas of Deccan, Arabia, Asia-Minor and Spain; The central plateau of France, and those of Switzerland, Bavaria, and Transylvania, vary from one thousand to four thousand feet in elevation.

Soil and Climate of Plateaus

The nature of the soil and climate of great plateaus is in general such as to render them the least useful portions of the continents. Sahara, with an average altitude of 1,000 feet, and the higher

plateaus of Mongolia, Iran and parts of the American Basin, may serve as types.

Their surface consists of hardened sand and rock; of hillocks and plains of loose sand constantly shifting by the wind; and of immense tracts, as in Mongolia, covered with pebbles varying from the size of a walnut, or even less, to a foot in diameter: all indicating the original transporting, grinding and depositing of these materials by water.

Salt lakes without outlet occur in each, and salt efflorescence often covers the ground. A lack of rain to wash from the soil substances injurious to vegetation, and supply the water necessary for the growth of plants, leaves these plateaus generally sterile, and some of the most extensive are in part, if not wholly, deserts.

MOUNTAINS AND THEIR STRUCTURE

Mountains rise in long and comparatively narrow lines or ridges, the tops of which are often deeply indented, presenting to the eye the appearance of a series of peaks detached one from another. As each of these peaks or distinct elevations is called a mountain and often receives a separate name, the common designation chain or range of mountains is naturally applied to the whole.

The top of the ridge, from which the waters descend on opposite sides, is called the crest; and the notches between the peaks, from which transverse valleys often stretch like deep furrows down the slopes of the chain, are called passes.

HOW MOUNTAIN CHAINS FORM SYSTEMS

Mountain chains are seldom isolated, but are usually combined into *systems*, consisting of several more or less parallel and connected chains, with their intervening valleys,—as the Appalachian system, the Alps, and the Andes.

Most mountain chains seem to have been produced by tremendous lateral pressure in portions of the Earth's crust, causing either long folds, or deep fissures with upturned edges rising into high ridges, the broken strata forming ragged peaks.

TWO TYPES OF MOUNTAIN CHAINS

Mountains by folding are generally of moderate elevation, while mountains by fracture include the highest chains of the globe. The Appalachian Mountains in North America, and the Jura in Europe, are examples of the first; the Rocky Mountains, Andes, Alps and Himalayas, of the second.

Folded mountains are curved into long arches, either entire or broken at the summit and forming a system of long, parallel ridges, of nearly equal height, separated by trough-like valleys. Here and there, however, deep gaps, or gorges, cut the chains allowing the rivers to escape from one valley to another.

In systems of mountains produced by fracture, there is usually one main central chain, with several subordinate ranges. They have, however, less regularity and similarity among themselves than the parallel chains of mountains by folding.

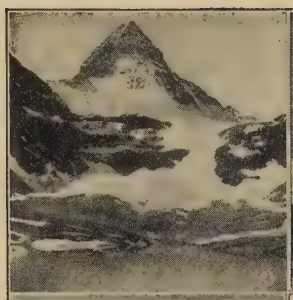
The crests are deeply indented, cut down one-third or one-half the height of the range, forming isolated peaks and passes which present to the eye the appearance of a saw, called in Spanish Sierra; in Portuguese, Serra. Such ranges are frequently distinguished by these terms, as the Sierra Nevada, in North America; and the Serra do Mar, in Brazil.

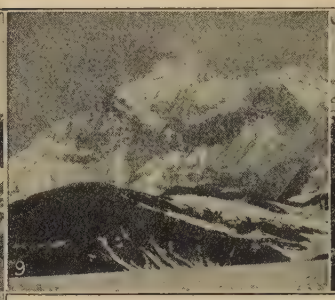
HOW VALLEYS ARE FORMED

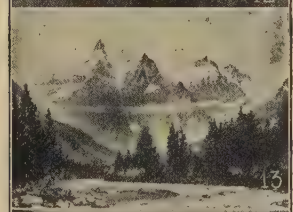
Valleys among mountains owe their existence primarily to folds or fissures in the Earth's crust, produced in the upheaving of the ranges; but they are subsequently deepened, widened and otherwise changed in form and extent, by the action of rains and frosts, and the streams to which they furnish a pathway. Most of the Alpine lakes, celebrated for their picturesque beauty, occupy deep basins at the outlet of transverse valleys.

Valleys in plains and plateaus are mainly, if not entirely, the result of the erosion, or wear of the surface, by running water.

Little rills, formed by the rains or issuing from springs, set out on their course down the slope of the ground, each wearing its small furrow in the surface. Uniting they form a rivulet which wears a broader and deeper channel; and the rivulets in turn combining, form







CELEBRATED MOUNTAIN PEAKS THAT STAND

1. Mount Everest, the loftiest mountain in the world, is situated in Nepal, India, and rises to an ascertained height of 29,000 feet—almost six miles. It was named for Sir George Everest, an English engineer, and outline Surveyor-General of India. Everest is only one of numerous gigantic peaks of the Himalayas—often called the "Roof of the World"—and is apparently guarded against all attempts at ascent by a rampart of lofty pinnacles. It is best viewed from a point near Darjeeling, India, one hundred and twenty miles distant. From this point travelers are enthralled with the glistening peak of mountain piles as nowhere else on earth. Though a thousand times described, the view is so surpassingly sublime that its full glory can never be depicted in words.

2. Mont Blanc (*mŏn-blon-g*) is the highest mountain in Europe, and of the Alps. It is located between Great and Little St. Bernard passes, on the frontier of France, Switzerland and Italy; and is best seen and approached from the village of Chamouix (*shä-mo-nē'*), France. It was first ascended in 1786, but frequently since, and, in 1893, an observatory was built on its summit. The Mont Blanc chain is famous for glaciers. Many great poets have described the majesty of Mont Blanc, among them, Goethe, Victor Hugo, Byron, Shelley, Wordsworth, and Coleridge.

3. The Matterhorn, or Mount Cervin, a splendid mountain obelisk, towers above Zermatt, Switzerland, on the Italian border. The eastern side seems almost vertical, and its ascent is very difficult; hence its name which is due to the formation of the rocky, horn-shaped peak. The loss of life attending its ascent has given the Matterhorn the grim name "Fatal Mountain."

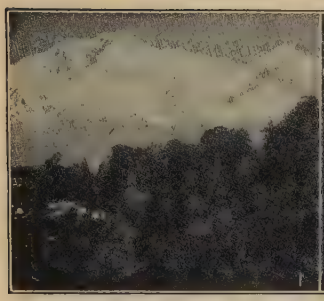
4. Monte Rosa (*mŏn'te rō'sa*), "rosy mountain," is next to Mont Blanc, the highest Alpine peak. It is the border between Italy and Switzerland, sixty miles north of Turin, Switzerland. Unlike the Matterhorn, Monte Rosa is easy of ascent and is frequently climbed by ladies. Its name refers to the glaciers which abound and reflect beautiful colors.

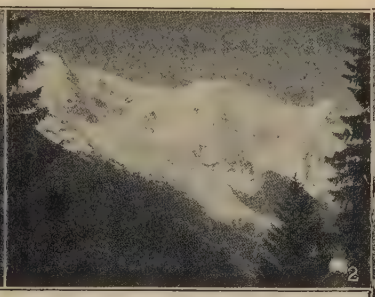
5. Jungfrau (*yung'frau*), "virgin," is one of the Bernese Alps, Switzerland, thirteen miles from Interlaken. It is so named from the pure whitness of its snowclad peak. A wonderful mountain railway now reaches to the summit, most of the line being through tunnels. Jungfrau is 13,670 feet high.

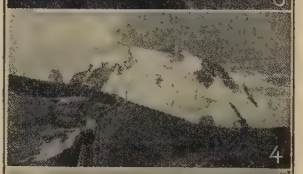
6. Mount Elburz is one of the loftiest and most impressive of all the Caucasian mountains. It is an extinct volcano with two peaks, the western peak 18,470 feet above sea-level, and the other 18,347 feet. It is covered with glaciers, and constitutes a water-shed which divides Asia from Europe. The Caucasus gave its name to that great branch of the human race that has ruled the world for many generations.

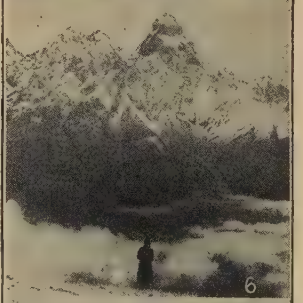
7. Mount Sinai (*si'nā* or-*nī*), famous as the sacred mountain on which Moses received the Ten Commandments, is an individual peak in a vast rocky mass that almost fills the peninsula of Sinai between the Gulf of Suez and Gulf of Akaba. It is named from *Sin*, the Babylonian moon-god. At its foot, in a ravine, is the monastery of St. Catherine, founded by the Emperor Justinian; a short distance from it the Chapel of St. Elias (Elijah); while on its summit is a little pilgrim church. Its height is 8,593 feet.

8. Pike's Peak. This famous mountain is six miles from Colorado Springs, Colorado, and may be ascended by a cog railway. It is one of the best-known summits of the Rocky Mountains, and rears its snowy crest to a height of 14,134 feet. On its top is one of the highest weather stations









AS THE EARTH'S GREATEST SENTINELS

in the world. The view from the observatory is superb, embracing thousands of square miles of mountain and plain.

9. Mount St. Elias, on the Alaskan side of the Canadian frontier, was long considered the highest peak in North America. It is a volcanic mountain, stands in a wild, inaccessible region, and is clothed almost from base to summit with eternal snow. Besides, there are huge glaciers, impassable precipices and yawning chasms. Its height is 18,020 feet. It was ascended by the Duke of the Abruzzi in 1897.

10. Mount Assiniboine (*as-sin'i-boin*) is frequently called the "Matterhorn of the Canadian Rockies". It is 11,860 feet in height, and is located near the boundary of British Columbia and Alberta, about twenty miles south of Banff, in one of the most beautiful scenic regions in America. In the immediate vicinity there are geysers, caves, waterfalls, numerous lakes, natural bridges, and glaciers.

11. Mount Popocatepetl (*pō-pō-kă-tā-pet'l*) is one of the giant volcanic peaks standing guard over Mexico City. Its summit is perpetually covered with snow, but it may be ascended from Popo Park, the terminal of the railway which climbs its slope, to a height of 8,000 feet. The peak itself is 17,887 feet, at the apex of which is a huge crater sheathed with ice, from which clouds of vapor are continually ascending. No great eruption, however, has taken place since 1540. The most imposing spectacle of all from the summit is the remarkable formation of clouds below.

12. Mount Salcantay, one of the most beautiful peaks of the Andes, in Peru, is 21,000 feet in height. Its grandeur is enhanced by the presence of glaciers and the enveloping clouds. It rises to a sharp point with its sides covered with snow and ice, and lifts its head magnificently thousands of feet higher than the surrounding mountains. It has been recently explored by the Yale University expedition.

13. Mount Robson, the highest point in the Canadian Rockies, reaches an elevation of 13,700 feet. It is on the border between Alberta and British Columbia, one of the remarkable "show places" of the Canadian Rockies. All around it is the finest of scenery—huge mountains, snow-crested peaks, rushing rivers that swirl and foam, mysterious canyons and earth-strewn boulders.

14. Mount Rainier (*rā'ner*) an isolated mountain of the Cascade Range, forty miles southeast of Tacoma, Washington, is an extinct volcano, 15,529 feet in height. There are still two craters at the summit which give off heat and sulphurous fumes. Thick forests cover the lower region of the mountain, while higher up there are fourteen glaciers. It is difficult of ascent, though frequently made. A bridle path leads to a point over 7,000 feet in elevation from which a magnificent view of several of the glaciers may be had.

Mount Ararat, famed as the mountain where Noah's ark landed after the flood, as recorded in Genesis, is in the Turkish province of Armenia. Ararat is really a twin mountain, the two peaks of which are about seven miles apart, with an elevation of about 17,000 and 13,000 feet, respectively. They rise above a beautiful alluvial plain, and quite naturally the higher peak—Great Ararat—is the one made historically immortal as the motherland of the human race. From their isolation and bareness the two peaks are very impressive, and it is little wonder that Armenia regards these mountain tops as a crown of glory and all other lands as her daughters. Within her borders, too, she gives rise to the beautiful rivers Euphrates, Tigris, Pison, Araxes, and many others. The first modern ascent of the mountain was made in 1829, though often since.

rivers which produce still greater effects.

The great basin of the Mississippi for example, is one grand central valley, cut by the main stream in the line of lowest level, towards which the valleys of the Missouri, the Arkansas, the Ohio, and a multitude of smaller streams, all converge.

REMARKABLE CANONS OF THE ROCKY MOUNTAIN PLATEAUS

Wonderful examples of valleys by erosion occur in the plateaus adjacent to the Rocky Mountains. The Grand Canon of the Colorado, three hundred miles long, has a depth of from three thousand to six thousand feet below the surrounding country. The sides of this tremendous gorge, which are nearly or quite precipitous, exhibit the successive geological strata down to the oldest rocks. A similar formation exists in the upper course of the Yellowstone, one of the main tributaries of the Missouri, and to a less extent in all the streams flowing through the high barren plateaus.

Valleys descending the slopes of mountains are formed in the same manner. The gathering drops make the rill, and the rill its little furrow; rills combine into rivulets, and rivulets make a gully down the hill-side; rivulets unite to form torrents, and these work with accumulating force, and excavate deep gorges in the declivities. Other torrents form in the same manner about the mountain ridge, and pursue the same work of erosion until the slopes are a series of valleys and ridges, and the summit a bold crest overlooking the eroding waters. The larger part of the valleys of the world are formed entirely by running water.

ISLANDS OF THE WORLD

The multitude of small and apparently fragmentary bodies of land, called islands, form only about one-seventeenth part of the entire land surface of the globe.

CONTINENTAL AND OCEANIC ISLANDS

Continental islands are situated in the immediate vicinity of the continents, and form properly a part of the continental structure. They have the same kinds of rocks and mountain forms, and the same varieties of plants and large animals, which are found on the neighboring coasts of the mainland.

The size of this class of islands varies extremely. Some are mere isolated rocks, while others occupy large areas, like the British Isles, Japan Islands and Madagascar; or, more extensive still, Papua and Borneo, each of which has an area exceeding two hundred thousand square miles.

The distinctive character of Oceanic islands is that they lie at a distance from the continents, in the midst of the ocean basins. They are always small, and, though sometimes forming lines, or bands, they more frequently occur in groups.

The rocks which make up the body of the continents and continental islands—sandstone, slate, granite, and the various metamorphic rocks—are entirely wanting in oceanic islands. The latter are composed either of volcanic substances, or of limestone. Hence they present much less variety in relief forms than the continental islands.

FORMS OF VOLCANIC ISLANDS

The islands of volcanic origin are more or less circular in outline; are usually considerably elevated, with rapid slopes; and are of moderate size. Sometimes two or more volcanoes, clustered together, form a single island of larger size and more irregular outline.

Occasional islands rise but little above the surface of the sea, their craters being filled by sea water. Many, however, rise to Alpine heights—like the peaks of Hawaii, in the Hawaiian Islands, nearly fourteen thousand feet in elevation; Pico de Teyde, in the Canaries, fourteen thousand feet; and Tahiti, in the Society Islands, over seven thousand feet above the level of the sea.

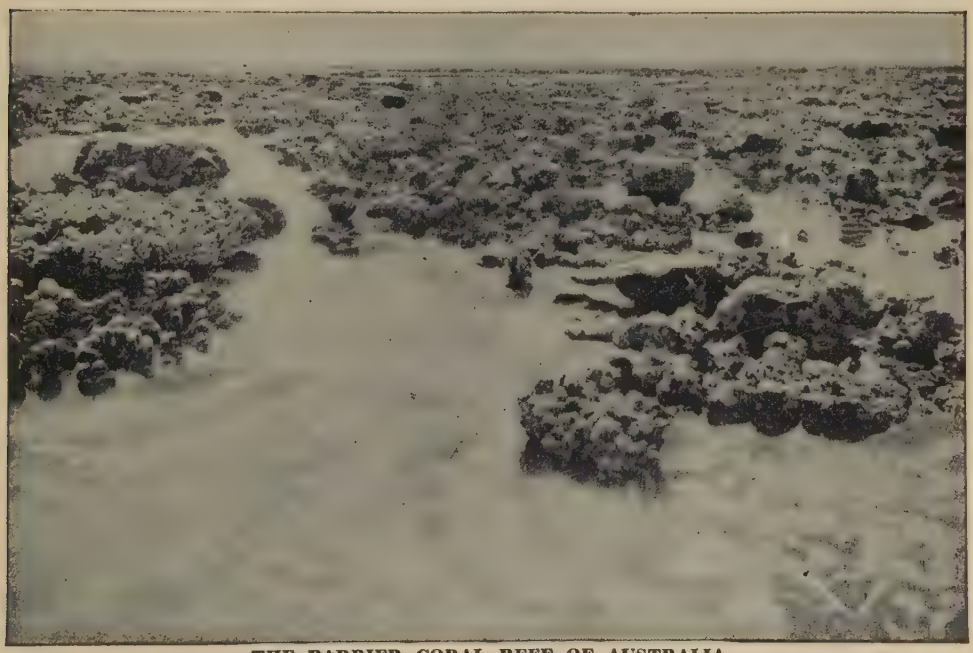
WONDERFUL STRUCTURE OF CORAL ISLANDS

Coral islands are among the most striking phenomena of the tropical seas. Whitsunday Island in the midst of the Pacific is an excellent example. Rising but a few feet above the surface of the ocean, if forms a narrow, unbroken, nearly circular ring, surrounding a central lagoon of quiet water. When first seen, it presents the aspects of an angry

TWO OF THE GREATEST MARVELS OF LAND AND SEA

THE GRAND CANYON OF THE COLORADO RIVER, ARIZONA

This greatest of nature's gorges is more than twelve miles across, a mile deep, and extends over two hundred miles in length. This whole vast space has been sculptured by the wear of the river through countless centuries. Its unparalleled magnitude, its architectural forms and suggestions, and its wealth of color effects create a picture that is grand beyond description.



THE BARRIER CORAL REEF OF AUSTRALIA

This vast reef of coral islands was built by a colony of coral-formers, or polyps, as innumerable as the stars of the Milky Way. It rose from the floor of the ocean, builded out of myriads upon myriads of the dead skeletons of these marvelous animals.

surf breaking on a white beach of coral sand, in strong contrast with the deep blue color of the sea. Behind this a garland of luxuriant vegetation, whose tropical beauty, enhanced by the noble cocoa-palm encircles the quiet waters of the lagoon, while all around spreads the broad blue sea.

COMBINATION OF VOLCANIC AND CORAL ISLANDS

A large number of volcanic islands in the Pacific are encircled by coral reefs, which, when near the shore, are called fringing reefs. When at a considerable distance, leaving a lagoon of quiet water between them and the volcanic island, they are termed barrier reefs.

CORAL REEFS AND THEIR BUILDERS

Coral reefs are masses of limestone originally secreted, in the form of coral, by minute polyps which live in countless numbers in the tropical seas. The coral produced by a single community of polyps grows chiefly upward; but multitudes of distinct communities often live so near together that the small lateral growth of each brings them into contact.

Their separate, fragile structures, gradually broken up and compacted by various means, are in time transformed into a solid mass, forming walls of coral rock frequently of enormous extent. The great barrier reef near the northeastern shores of Australia, the longest known, is not less than one thousand two hundred and fifty miles in length.

Reef-building polyps do not live below the depth of one hundred or one hundred and twenty feet, and hence require a

A LIVING SINGLE CORAL FROM THE PACIFIC OCEAN

The coral polyp is one of the master-builders of the world. It may be likened to a sea-anemone, bzt is inferior n muscular organism, and immensely superior in defensive organization.

foundation near the surface. This is supplied by submarine mountains and plateaus, or the slopes of those volcanic cones which form the high islands.

Growing vertically, the reefs repeat at the surface the outlines of their bases, which fact gives rise to the circular figure both of atolls and reefs in mid-ocean, and to the elongated, wall-like form of reefs adjacent to the continents, like those of Florida and of Australia.

DISTRIBUTION OF CORALS

Reef-building polyps are confined to the tropical seas, where the winter temperature is not below sixty-eight degrees. Coral formations are most extensive in the Pacific Ocean, especially south of the Equator, and in the two great archipelagoes of the East and West Indies; but a large number of coral islands also occur in the Indian Ocean. The Coral Sea, east of northern Australia, is particularly remarkable for the great extent of its coral reefs.

THE ATOLL FORM OF ISLAND

The usual form of coral islands is that of a broken ring, numerous channels affording entrance into the lagoon. Such a group of islands is called an atoll, a Malay term, which has been adopted to designate these singular structures. The central lagoon enclosed by an atoll, is invariably shallow, seldom exceeding a few scores, or at most hundreds, of feet in depth; while the outer sea reaches a depth of thousands of feet at a short distance from the shore, showing that the atoll rests upon a submarine mountain.

Atolls are often clustered together in large numbers, forming extensive archipelagoes. Paumotu, or Low Archipelago, numbers eighty coral islands, nearly all of which are atolls; the Caroline, Gilbert and Marshall islands together contain eighty-four atolls, while the Laccadive and Maldive islands form two long double series of atolls extending eight hundred miles from north to south.

MAP SHOWING COMPARATIVE SIZE OF ISLANDS

(See next page for the Area, Population and Countries to which these islands belong).

ISLANDS OF WESTERN HEMISPHERE

MOST NOTED ISLANDS OF THE WORLD—WESTERN HEMISPHERE

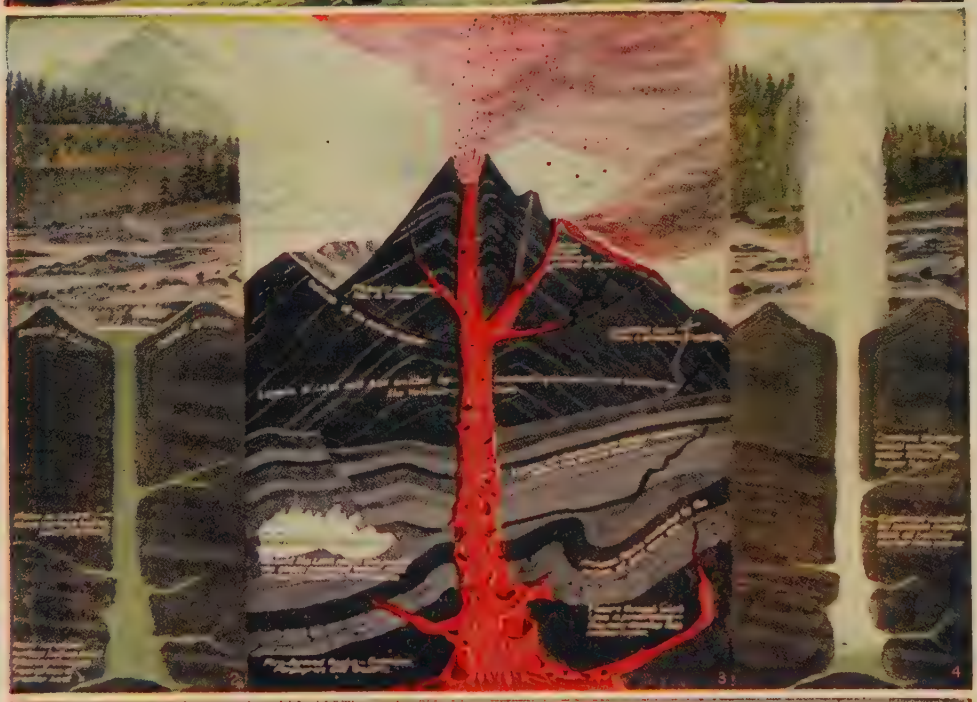
Name and Sovereignty	Area Square Miles	Population	Name and Sovereignty	Area Square Miles	Population
Anticosti (to Britain)	2,600	500	**Jamaica** (to Britain)	4,200	865,000
Bahamas (to Britain)	4,404	58,000	**Long Island** (to U. S.)	1,682	2,700,000
Bermudas (to Britain)	20	20,000	**Martinique** (to France)	378	180,000
Cape Breton (to Britain)	3,120	100,000	**New Foundland** (to Britain)	42,734	218,000
Cuba (Independent)	44,164	2,155,000	**Porto Rico** (to U. S.)	3,604	1,120,000
Dominica (to Britain)	291	35,000	**Prince Edward** (to Britain)	2,184	94,000
Falkland (to Britain)	5,500	3,250	**Santo Domingo** (Independent)	28,250	2,700,000
Feeji, or Feejee (to Britain)	7,435	155,000	**Sandwich or Hawaiian** (to U.S.)	6,449	192,000
Galapagos (to Ecuador)	2,400	400	**Staten Island** (to U. S.)	65	86,000
Greenland (to Denmark)	46,740	15,000	**Tahiti** (to France)	1,500	30,000
Guadeloupe (to France)	688	182,000	**Tierra del Fuego** (to Argentina)	18,500	1,700
Hawaiian. See Sandwich.			**Trinidad** (to Britain)	1,750	350,000
Isla de Pinos (Isle of Pines) (to Spain)	1,200	32,000	**Vancouver** (to Britain)	15,937	55,000

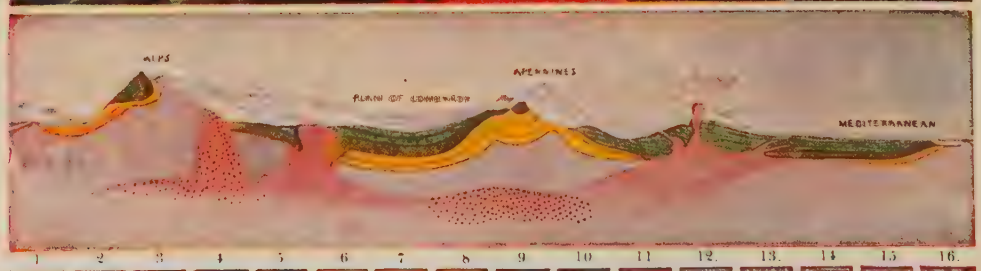
MAP SHOWING COMPARATIVE SIZE OF ISLANDS

ISLANDS OF EASTERN HEMISPHERE

MOST NOTED ISLANDS OF THE WORLD—EASTERN HEMISPHERE

Name and Sovereignty	Area Square Miles	Population	Name and Sovereignty	Area Square Miles	Population
Balearic Islands (to Spain)	1,935	326,000	**Madeira Islands** (to Portugal)	314	150,600
Borneo (to Britain and Holland)	284,000	2,000,000	**Malta** (to Britain)	117	229,000
Canary Islands (to Spain)	2,807	420,000	**New Guinea.** See Papua.		
Candia, or Crete (to Turkey)	3,365	243,000	**New Zealand** (to Britain) N. Island	44,468	564,000
Cape Verde Islands (to Portugal)	1,480	148,000	(to Britain) S. Island	58,325	445,000
Celebes (to Holland)	71,470	2,000,000	**Papua, or New Guinea** (to Britain, Germany and Holland)	313,183	710,000
Ceylon (to Britain)	25,332	3,595,000	**Philippines** (to U.S.) Luzon	40,969	3,800,000
Corsica (to France)	3,378	290,000	Mindanao	36,292	500,000
Cypress (to Britain)	3,584	140,000	Panay	4,611	744,000
Elba (to Italy)	85	27,000	Cebu	1,762	593,000
England (Independent)	88,729	40,835,000	Leyte	2,722	358,000
Formosa (to Japan)	13,458	3,392,000	**St. Helena** (to Britain)	47	3,520
Gothland (to Sweden)	1,217	56,000	**Sakhalin** (Japan and Russia)	29,000	30,000
Hainan (to China)	16,000	2,000,000	**Sardinia** (to Italy)	9,306	854,000
Iceland (to Denmark)	39,756	86,000	**Sicily** (to Italy)	9,935	3,685,000
Ireland (to Britain)	32,360	4,382,000	**Spitzbergen** (to Norway)	27,000	.....
Japan Honshiu	87,485	37,415,000	**Sumatra** (to Holland)	165,000	3,200,000
Khiushiu	16,840	7,727,000	**Van Dieman, or Tasmania** (to Britain)	26,215	197,000
Skikoku	7,031	3,290,000	**Zanzibar** (to Britain)	640	115,000
Hokkaido (Yezo)	36,299	1,140,000			
Java (to Holland)	50,554	30,100,000			
Madagascar (to France)	227,950	2,745,000			





MARVELS OF THE EARTH'S ROTATION, FORCES AND STRUCTURE

1. Midnight Sun Within the Arctic Circle. 2. The Geyser At Rest.
3. Picture Diagram of a Section through a Volcano like Vesuvius. 4. The Geyser in Action.
5. Section of the Earth's Crust across France and Italy.

1. Precambrian or Archaean. 2. Cambrian and Ordovician. 3. Silurian. 4. Carboniferous Limestone. 5. Coal Measures. 6. Permian. 7. Trias. 8. Jurassic. 9. Chalk. 10. Tertiary. 11. Volcanic Rocks. 12. Glacial Deposits. 13. Granite. 14. Gneiss. 15. Schist. 16. Alluvium.

VOLCANOES, GEYSERS AND EARTHQUAKES

THE REMARKABLE SUBMARINE VOLCANO OF SANTORIN (*Săn-to-rēn*)

In this little Bay of Santorin, enclosed by an island of the same name in the Grecian Archipelago, occurred probably the most remarkable volcanic exhibition known. During an eruption in 1866 flames issued from the sea, rising sometimes to a height of twenty-five feet, and a dense column of white smoke mounted to an immense height. Within a few days a new island appeared which gradually became united to the present Santorin.

CAUSE, STRUCTURE AND LOCATION OF VOLCANOES

The primary cause of volcanoes, as of geysers, earthquakes and other similar phenomena of nature, is the intensely heated condition of the earth's interior. It is the same force that has produced the irregular features of the earth's surface—its mighty mountain chains, the sunken basins of the oceans, and its hills, valleys and gorges. Quite logically, volcanoes are most numerous and most intense along the deep mountain fissures which establish a ready communication between the interior and the surface of the earth. Consequently the significant facts about them are: (1) Nearly all volcanoes are either along the highest border of the continents, or in the great central zone of fracture; (2) most of the volcanic groups exhibit a linear arrangement; (3) the agent at work in these mighty engines is mainly vapor of water, or steam power.

WHAT VOLCANOES ARE AND HOW THEY ACT

The form of typical volcanic mountain is that of a cone, with a circular basin or depression, called a crater, at its summit. In the center of the crater is the mouth of a perpendicular shaft or chimney, which emits clouds of hot vapor and gases; and in periods of greater activity, ejects ashes, fragments of heated rock, and streams of fiery lava.

Volcanic ashes, when examined under a microscope, are found to be simply pulverized lava, frequently in minute crystals, and bear no resemblance to ashes in the ordinary sense of the term.

The lava stream, when flowing white hot from the crater, is not unlike a jet of melted iron escaping from a furnace, and moves at first with considerable rapidity. It soon cools on the surface, and becomes covered with a hard, black, porous crust, while the interior remains

melted and continues to flow. If the stream is thick, the lava may be found still warm after ten or even twenty years.

The amount of matter ejected by volcanoes is very great. The whole island of Hawaii, the largest of the Hawaiian Islands, seems to be only an accumulation of lava thrown out by its four craters. All high oceanic islands are of the same character. Iceland, with an area of forty thousand square miles, is a vast table-land from three thousand to five thousand feet in elevation, composed of volcanic rock similar to the lavas still ejected by its numerous volcanoes.

VESUVIUS THE MOST REMARKABLE VOLCANO

Nearly all active volcanoes have intervals of comparative repose, interrupted by periods of increased activity, which terminate in a violent ejection of matter from the interior, during which the volcano is said to be in a state of eruption.

The phenomena which characterize these differing phases of volcanic activity may be best made clear by describing them as actually observed in Vesuvius, one of the most carefully studied and most active volcanoes of modern times.

Vesuvius is a solitary mountain rising to the height of nearly 4,000 feet, from the midst of a highly cultivated plain which borders upon the shores of the Bay of Naples. Though the mountain has a regular conical form, two summits, very nearly equal in height, are visible from Naples—Monte Somma on the north, and Vesuvius proper on the south.

The Eruption begins generally with a tremendous explosion which seems to shake the mountain to its very foundations, and hurls into the air dense clouds of vapor and ashes. Other explosions succeed rapidly, and with increasing violence, each sending up a white, globular cloud of steam, or aqueous vapor. This long array of clouds, accompanied by dark ashes, volcanic sand, and fragments of red-hot lava of all sizes, soon forms a stupendous column.

Finally the boiling lava overflows the rim of the crater, and descends in fiery torrents down the slopes; or, bursting the mountain by its weight, finds a vent through some fissure far below the summit. After the expulsion of the lava the eruption is generally near its end, though it does not necessarily terminate at once. Alternate phases of outbursting steam, ashes, and lava may continue with more or less violence for weeks or even months.

The sudden condensation of the enormous accumulation of hot vapor thrown into the air by the eruption, gives rise to striking atmospheric phenomena. Vivid flashes of lightning start from all parts of the column, and play about the clouds above; and often a local thunderstorm, formed in the midst of a clear sky, pours a heavy rain of warm water and ashes upon the slopes of the mountain. The hot, destructive mud torrents, created by these rains, have often been mistaken for lava streams.

The majesty of the spectacle is still greater at night. Though flames of burning gases are of rare occurrence, the clouds and columns of vapor are strongly illuminated by the reflection of the white-hot lava within the crater; and fragments of this lava constantly thrown into the air give the column all the brilliancy of a gigantic piece of fire-work. The sky itself, far and wide, partakes of the same vivid coloring, and the whole scene resembles a vast conflagration.

SIZE AND DISTRIBUTION OF VOLCANOES

In size they vary from mere mounds a few yards in diameter, such as the salses or mud-volcanoes near the Caspian, to Etna, 9,652 feet high, with a base thirty miles in diameter; Cotopaxi, in the Andes, 18,880 feet high; or Mauna Loa, in the Sandwich Isles, 13,600 feet high, with a base seventy miles in diameter and two craters, one of which, Kilauea, is the largest active crater in our earth, being seven miles in circuit.

Two great terrestrial zones include nearly all the known volcanoes of the globe, arranged in long bands or series, or in isolated groups.

First Zone. This includes the vast array of mountain chains, peninsulas, and bands of islands which encircle the Pacific Ocean with a belt of burning mountains. Within it occur, in the New World: (1) the Andes mountains, with three of the most remarkable series of volcanoes—those of Chili, Bolivia, and Ecuador—separated by hundreds of miles; (2) the volcanic group of Central America; (3) the series of Mexico; (4) the series of the Sierra Nevada and Cascade mountains; (5) the group of Alaska; and (6) the long series of the Aleutian Islands.

In the Old World are: (1) the series of Kamchatka and the Kurile Islands; (2) the group of Japan; (3) the series south of Japan, including Formosa, the Philippine and the Molucca Islands; and (4) the Australian series, including New Guinea, New Britain, New Hebrides, and New Zealand. In this vast zone there are not less than four hundred volcanoes, one hundred and seventy of which are still active.

Second Zone. This contains the belt of broken lands and inland seas, which

extending round the globe, separates the northern from the southern continents, and intersects the first zone, in the equatorial regions, nearly at right angles.

In it are: (1) the volcanic regions of Central America and Mexico, and the series of the Lesser Antilles; (2) the groups of the Azores and Canary islands (3) the Mediterranean islands and peninsulas, including all the active volcanoes of Europe; (4) Asia Minor with numerous extinct volcanoes; (5) the shores of the Red Sea and Persian Gulf, and the two Indias, rich in traces of volcanic action; (6) the East Indian Archipelago with hundreds of burning mountains; and (7) the Friendly Islands and other volcanic groups of the central Pacific.

In this zone there are no less than one hundred and sixty volcanoes, so that the two volcanic zones together contain five hundred and sixty, or five-sixths of all known.

Isolated Volcanoes. The volcanoes not included in these two great zones are isolated, in the midst of the oceans, or in the broken polar lands. The most noted are the Hawaiian Island group, in the Pacific; Bourbon and Mauritius, in the Indian Ocean; Cape Verde Islands, Ascension, St. Helena, and Tristan da Cunha, in the Atlantic; Iceland and Jan Mayen, in the Arctic Ocean; and Erebus and Terror, in Autarctic.

MOST NOTED VOLCANOES

Name	Location	Height (feet)
Altar	Ecuador	17,710
Antisana	Ecuador	19,335
Asosan	Japan	5,630
Cayambi	Ecuador	19,255
Chimborazo	Ecuador	21,424
Copiapo	Chile	19,700
Cotocachi	Ecuador	16,200
Cotopaxi	Ecuador	18,880
Demavend	Persia	18,500
Etna	Sicily	9,652
Fujiyama	Japan	12,390
Hecla	Iceland	5,110
Hood, Mt.	Oregon	11,225
Iztaccihuatl	Mexico	16,076
Kirishima-yama	Japan	5,530
Llullaillac	Chile	21,000
Maipo	Chile	17,670
Mauna Kea	Hawaii	13,953
Mauna Loa	Hawaii	13,600
Misti	Peru	20,015
Nevado de Colima	Mexico	14,210
Orizaba	Mexico	18,310
Pelée	Martinique, W. I.	4,300
Pichincha	Ecuador	15,918
Pico, Peak of	Azores	7,013
Popocatepetl	Mexico	17,748
Ruiz	Colombia	17,388
Sahama	Peru	23,000
Sangai	Ecuador	17,459
San Jose	Chile	20,020

MOST NOTED VOLCANOES—Continued

St. Elias, Mt.	Alaska	18,024
St. Helena, Mt.	United States	10,000
Stromboli	Lipari Islands	3,090
Tahiti, Peak of	Friendly Islands	7,400
Teneriffe	Canary Islands	12,000
Tolima	Columbia	18,069
Toluco	Mexico	14,950
Tunguragua	Ecuador	16,690
Vesuvius	Italy	4,260

EARTHQUAKES

Earthquakes are movements of the earth's crust, varying in intensity from a slight tremor or shaking of the ground to the most violent convulsions causing enormous destruction over wide areas.

Kinds of Motion Observed in Earthquakes

The wave-like or undulatory motion is most common and least destructive. It appears to be the normal one, and it is possible that the others may be simply the result of various systems of waves intersecting one another. The waves either advance in one direction, like waves of the sea, or spread from a central point, like ripples produced by dropping a pebble into still water.

The earthquakes of the Andes are chiefly linear, being propagated along the mountains, with the undulations perpendicular to the direction of the ranges. The destructive earthquake at Lisbon, was a central one, the concentric waves gradually diminishing in intensity with increasing distance from the place of origin.

The vertical motion acts from beneath like the explosion of a mine, and when violent nothing can resist its force. The earthquake at Calcutta, in September, 1828, owed its great destructiveness to the fact that the main shock was vertical; and one in Murcia, Spain, in 1829, destroyed or injured more than three thousand five hundred houses.

The rotary or whirling motion is the most dangerous, but happily the rarest of all. In the great earthquake of Jamaica, in 1692, the surface of the ground was so disturbed that fields changed places, or were found twisted into each other.

Earthquake Shocks and Sounds

Probably no part of the earth's surface is entirely free from vibration, but, fortunately, destructive earthquakes are confined to comparatively limited re-

gions. In most cases each shock lasts only a few seconds, but the tremblings that follow may be continued for days, weeks, or even months. Noises of sundry kinds usually precede, accompany, or succeed an earthquake. Some earthquakes, however, are not attended by any subterranean sounds. This has been the case with some of the most destructive South American disturbances. Thus at the time of the terrible shock which destroyed Riobamba in Ecuador in 1797, a complete silence reigned. On the other hand, subterranean sounds may be heard without any earth-tremor being preceived.

The sound which accompanies many earthquakes is due to the transmission to the air of vibrations in the soil. To produce sound-waves in the air, the ground must vibrate like a drumhead. Hence no sound will be heard when the oscillations are horizontal.

The velocity of propagation of an earthquake is very variable. Thus in the case of the earthquake of Lisbon in 1755, it seems to have considerably exceeded one thousand feet per second, while in the Lisbon earthquake of 1761 the rate was three times greater. At Tokio, in 1881, the velocity, as estimated by Professor Milne, varied between four thousand feet and nine thousand feet per second.

Depth of Earthquakes. Various attempts have been made to estimate the depth at which earthquakes originate. Mallet was of opinion that the centrum of the Neapolitan earthquake of 1857 was probably five and one-half miles from the surface. The same eminent physicist thought that an earthquake centrum probably never exceeded a depth of thirty geographical miles. According to Professor Milne, the angles of emergence of the earth-waves obtained during the Yokohama earthquake of 1880 showed that the depth of origin of that earthquake might be between one and one-half and five miles; and he gives a table, compiled from the writings of various observers, which exhibits the mean depths at which certain earthquakes have originated. These estimated depths range from 17,260 feet to 127,309 feet.

The area disturbed by an earthquake is generally proportionate to the intensity of the shock. The great earthquake of Lisbon disturbed an area four times as great as the whole of Europe. In the form of tremors and pulsations, Mr. Milne remarks, it may have shaken the whole globe.

In a violent submarine earthquake the ordinary earth-wave and sound-wave are accompanied by sea-waves. These waves may be twenty, sixty or even eighty feet higher than the highest tide, and are usually more dreaded than the earthquake shock itself in such regions as the maritime districts of South America. The greatest sea-wave on record is that which in 1737, is said to have broken near Cape Lopatka, at the south end of Kamchatka, two hundred and ten feet in height.

NOTABLY DESTRUCTIVE EARTHQUAKES

79. One accompanied by the eruption of Vesuvius; the cities of Pompeii and Herculaneum buried.
742. Awful one in Syria, Palestine, and Asia; more than 500 towns were destroyed and the loss of life surpassed all calculations.
936. Constantinople overturned; all Greece shaken.
1137. Catania, in Sicily, overturned, and 15,000 persons buried in the ruins.
1186. At Calabria; one of its cities and all its inhabitants overwhelmed in the Adriatic Sea.
1456. At Naples, 40,000 persons perished.
1537. At Lisbon; 1,500 houses and 30,000 persons buried in the ruins; several neighboring towns ingulfed with their inhabitants.
1596. In Japan; several cities made ruins, and thousands perished.
1662. One in China, when 300,000 persons were buried in Pekin alone.
1693. One in Sicily, which overturned fifty-four cities and towns, and 300 villages. Of Catania and its 18,000 inhabitants not a trace remained; more than 100,000 lives were lost.
1726. Palermo nearly destroyed; 6,000 lives lost.
1731. Again in China; and 100,000 people swallowed up at Pekin.
1746. Lima and Callao demolished; 18,000 persons buried in the ruins.
1754. At Grand Cairo; half of the houses and 40,000 persons swallowed up.
1755. Quito destroyed.
1755. Great earthquake at Lisbon. In about eight minutes most of the houses and upward of 50,000 inhabitants were swallowed up, and whole streets buried. The cities of Coimbra, Oporto, and Braga suffered dreadfully, and St. Ubes was wholly overturned. In Spain, a large part of Malaga became ruins. One-half of Fez, in Morocco, was destroyed, and more than 12,000 Arabs perished there. About half of the Island of Madeira became waste; and 2,000 houses in the Island of Mytilene, in the Archipelago, were overthrown. This awful earthquake extended 5,000 miles; even to Scotland.
1759. In Syria, extended over 10,000 square miles; Baalbec destroyed.
1783. Messina and other towns in Italy and Sicily overthrown; 40,000 persons perished.
1797. The whole country between Santa Fe and Panama destroyed, including Cusco and Quito, 40,000 people buried.
1840. Awful and destructive earthquake at Mount Ararat, in one of the districts of Armenia; 3,137 houses were overthrown, and several hundred persons perished.
1842. At Cape Haytien, St. Domingo, which destroyed nearly two-thirds of the town; between 4,000 and 5,000 lives were lost.
1851. In South Italy; Melfi almost laid in ruins; 14,000 lives lost.
1852. At Philippine Isles; Manila nearly destroyed.
1853. Thebes, in Greece, nearly destroyed.
1854. St. Salvador, South America, destroyed.

NOTABLY DESTRUCTIVE EARTHQUAKES —Continued

1854. Amasca, in Japan, and Simoda, in Nippon, destroyed; Jeddo much injured.
1855. Broussa, in Turkey, nearly destroyed.
1857. In Calabria, Montemurro and many other towns destroyed, and about 22,000 lives lost in a few seconds.
1858. Corinth nearly destroyed.
1859. At Quito; about 5,000 persons killed, and an immense amount of property destroyed.
1868. Cities of Arequipa, Iquique, Tacna, and Chincha, and many small towns in Peru and Ecuador destroyed; about 25,000 perished.
1883. Krakatoa island, between Sumatra and Java, East Indies, was the scene of a series of volcanic discharges in May to August, 1883, constituting the most tremendous eruption known to history. A cubic mile of rock material was hurled into the air, and the explosions were heard 150 miles away. Violent atmospheric disturbances and gigantic sea-waves, the latter causing great loss of life, estimated at more than 30,000. As a result of the explosion, the north part of the island, including its highest peak, altogether disappeared.
1886. Shocks throughout eastern United States; at Charleston, S. C., 41 lives and $5,000,000 worth of property lost.
1893. Islands of Zante and Stromboli, the former west of Greece, the latter one of the Lipari group, west of Calabria, Italy, severally shaken. Great loss of lives and property at Zante.
1906. Severe shocks in California wrecked San Francisco and adjacent towns, and caused the greatest fire in history, lasting two days. Great loss of life, and $300,000,000 of property destroyed; over 300,000 homeless. Stanford University buildings were damaged to the extent of $2,800,000, including the fine Memorial Church.
1906. At Valparaiso, Chile, causing great destruction of life and property.
1907. Large part of Kingston, Jamaica, destroyed.
1909. In Sicily and southern Italy, Messina and many towns and villages desolated. Appalling loss of life; thousands buried alive; the survivors homeless; one of the greatest earthquakes of modern times if not of all time.

GEYSERS

Geysers are eruptive hot springs found chiefly in volcanic districts, but particularly in the Yellowstone Park, Iceland, New Zealand, Tibet and the Azores. At intervals these fountains of hot water and steam sometimes rise to a height of two hundred feet. The eruptions occur at intervals varying from every hour to once a day.

All the geyser waters hold in solution a considerable quantity of silica. The highly heated water decomposes the felspar and other volcanic rocks, and becoming slightly alkaline with the soda or potash these contain, it is enabled to form a silicious solution. The silica taken up is deposited again round the mouth of the orifice. Minute plants termed algæ are known to live in the hot water, and to aid in throwing down the silica from solution to form the sinter deposits.

The cause of the periodical eruptions is probably to be found in the gradual increase of heat with the depth of the tube. In the middle and lower parts the temperature is far above the boiling-point (212° F.) at the ordinary pressure. But at last the lower portion rises to a position where the temperature is above the boiling-point at the pressure it there sustains, and then, flashing into steam, it hurls the column above into the air. After playing for a few minutes the water falls back into the basin, and remains quiet for a time.

WONDERFUL GEYSERS OF THE YELLOWSTONE

The geysers of the Yellowstone region are probably the most picturesque and wonderful in the world. On the Firehole River alone there are probably fifty geysers, throwing columns of water to a height of from fifty to two hundred feet, while smaller jets rise occasionally to two hundred and fifty feet. The "Old Faithful" geyser, in this region, throws up a column of water six feet in diameter to a height of one hundred to one hundred and fifty feet, at intervals of about an hour. Near the north entrance to the National Park, also, are the hot springs of the Gardiner River; here the "White Mountain," built up of terraces of white calcareous deposits, rises to a considerable height, with a diameter of one hundred and fifty yards at the top.

The geysers of Iceland are situated within sight of Mount Hekla and are the hottest springs in Europe. The principal geysers of this region are known as the "Great Geyser" or "Roarer," and the "Stroker" or "Churn."

The geysers of New Zealand attained celebrity chiefly on account of the beautiful terraces associated with them. Unfortunately, volcanic activity manifested itself throughout the region in 1886, resulting in the destruction of the terraces. The basins connected with these geysers, catching the overflow of water, are, like those of Yellowstone region, largely used by bathers, and are much resorted to by invalids.

The three localities mentioned are where geysers attain their highest development; but they also exist in many volcanic regions notably in Japan, South America, and the Malay Archipelago.

HOW THE EVER-MOVING WATERS OF THE EARTH GO ON THEIR MIRACULOUS JOURNEY FOREVER

The circulation of the waters of the earth is just as marvellous as that of the blood in the human body. First, it is drawn up from the sea by the sun and rises as vapor; the cool air condenses it first into cloud and then rain or snow; it runs together, forming springs and waterfalls and rivers; and finally it finds its way to the sea, where again the never-ending journey begins.

THE WATERS OF THE EARTH

THE WATERS UNDER THE EARTH

The underground lake in its magnificent setting of dazzling stone columns and stalactites in the Cheddar Caves, England. All these wonderful natural halls, chasms and snowy incrustations were formed by the age-long action of the water on the limestone rocks through which it filtered.

WATER IS found in Nature in three states or conditions—as ice, vapor or steam, and as simple water. These three forms have the same chemical composition—the substance being a compound of oxygen and hydrogen, represented by the formula H_2O; but the physical condition depends entirely on its temperature. Under ordinary atmospheric conditions water is a *solid* below 32 degrees Fahrenheit; a *gas* above 212 degrees Fahrenheit, and a *liquid* between these temperatures.

The purest form of water which exists in nature is rain water, though this always contains a little oxygen and carbondioxide dissolved from the air. To obtain pure water artificially, any ordinary water is distilled, when all the solids dissolved in it are left behind. River water and spring water always contain a small quantity of solid matter, the amount and nature of the dissolved solids depending on the nature of the rocks over which the water has flowed.

Geographically it may be considered under the four heads of *springs*, *rivers*, *lakes*, and the *ocean*, which taken together forms the *hydrosphere* of the earth.

WHERE SPRINGS HAVE THEIR SOURCE

SPRINGS, or the natural fountains of water, take their rise from reservoirs stored under ground. Water maintains a level, and hence the height to which a spring will rise depends on that of the level from which it is supplied. If the internal reservoir be on a hill, and the spring should gush out in a valley; the water may rise to a considerable height and form a natural fountain; but, on the other hand, if the reservoir be at some depth below the surface, the water may never reach the surface, and mechanical aid may be required to obtain it.

These internal reservoirs are in a great measure supplied by moisture derived from rain, snow, mist, and dew. The atmospheric water enters the earth through porous rocks, or by means of fissures, and continues to sink until arrested in its progress by rocks, such as clay, which will not permit the water to pass, or by faults which check it

from spreading. The waters will then gush forth as a spring, of greater or less size, according to the supplies it may have received.

HOW MINERAL SPRINGS ARE FORMED

All springs contain a certain portion of air and gas, and also some solid matter, usually in the form of salts. When these salts are abundant, mineral springs are the result, which may be classified according to the character of their several properties, as acidulous, chalybeate, sulphurous, saline, calcareous, and silicious.

Acidulous or acid springs are those surcharged with carbonic acid gas.

Chalybeate springs are those in which iron, in the form of carbonate or sulphate, is held in solution.

Sulphur, in the form of sulphureted hydrogen or sulphate of lime, is the distinguishing ingredient in Sulphurous springs.

Saline springs are of two kinds—brine and medicinal; brine when containing a greater or less amount of chloride of sodium or common salt, and medicinal when containing other salts, as sulphate of soda, etc.

Calcareous springs are those highly charged with the salts of lime, and which have the property of petrifying substances placed within their reach, and also of depositing their contents, forming the stalactites and stalagmites of caverns, etc.

Silicious springs are so called from holding silica or flint in solution. The last-named are all hot or thermal as well as mineral springs, deriving their heat either from the natural heat of the earth at great depths, or from volcanic action. When occurring near volcanoes, they are frequently charged with bitumen, petroleum, naptha, asphaltum, etc.

WHY WATER FLOWS FROM ARTESIAN WELLS

An important class of artificial springs or wells is known as Artesian Wells. Where bent pervious beds of rock lie between two bent impervious beds, so as to make a basin-shaped depression, lower in the middle than at the edges, the rain which sinks into the pervious rock where it reaches the surface will begin to gather in the central part of the porous rock as in a reservoir.

If a hole be now bored in the hollow of the upper impervious bed till it reaches the water-bearing stratum, the water will flow out at the top. The water thus obtained may have fallen a distance of many miles several months previously, and if the gathering-ground be high the issue at the well may be forced by the pressure of the water behind to a considerable height.

FORMATION, CHARACTERISTICS AND PECULIARITIES OF RIVERS

Rivers have their sources from springs or from the melting of accumulations of snow. They do not, however, receive their largest supplies from the actual summits of mountains, for copious springs are rarely met with in such situations, nor are glaciers formed on the highest points of mountains, but more usually on slopes of the upper mountain valleys. It is, accordingly, in the latter localities that many of the largest rivers take their rise.

WATERSHED. It not unfrequently happens that several rivers take their rise in one mountain ridge, some flowing in one direction, and others taking an opposite course. Such a ridge is termed a *watershed.* Thus the Rhine, the Rhone, and the Danube all take their rise in the Alps, the first discharging itself into the North Sea, the second into the Mediterranean Sea, and the last into the Black Sea.

BASIN. The portion of country drained by a river and its tributary streams is called it *basin*, from its catching the rains which fall within its circuit, and which the river carries to the sea. The largest river-basin in Europe is that of the Volga, in Asia, that of the Obi (Ob), in Africa that of the Congo, in North America that of the Mississippi, and in South America that of the Amazon.

THE GREAT RIVERS OF THE WORLD

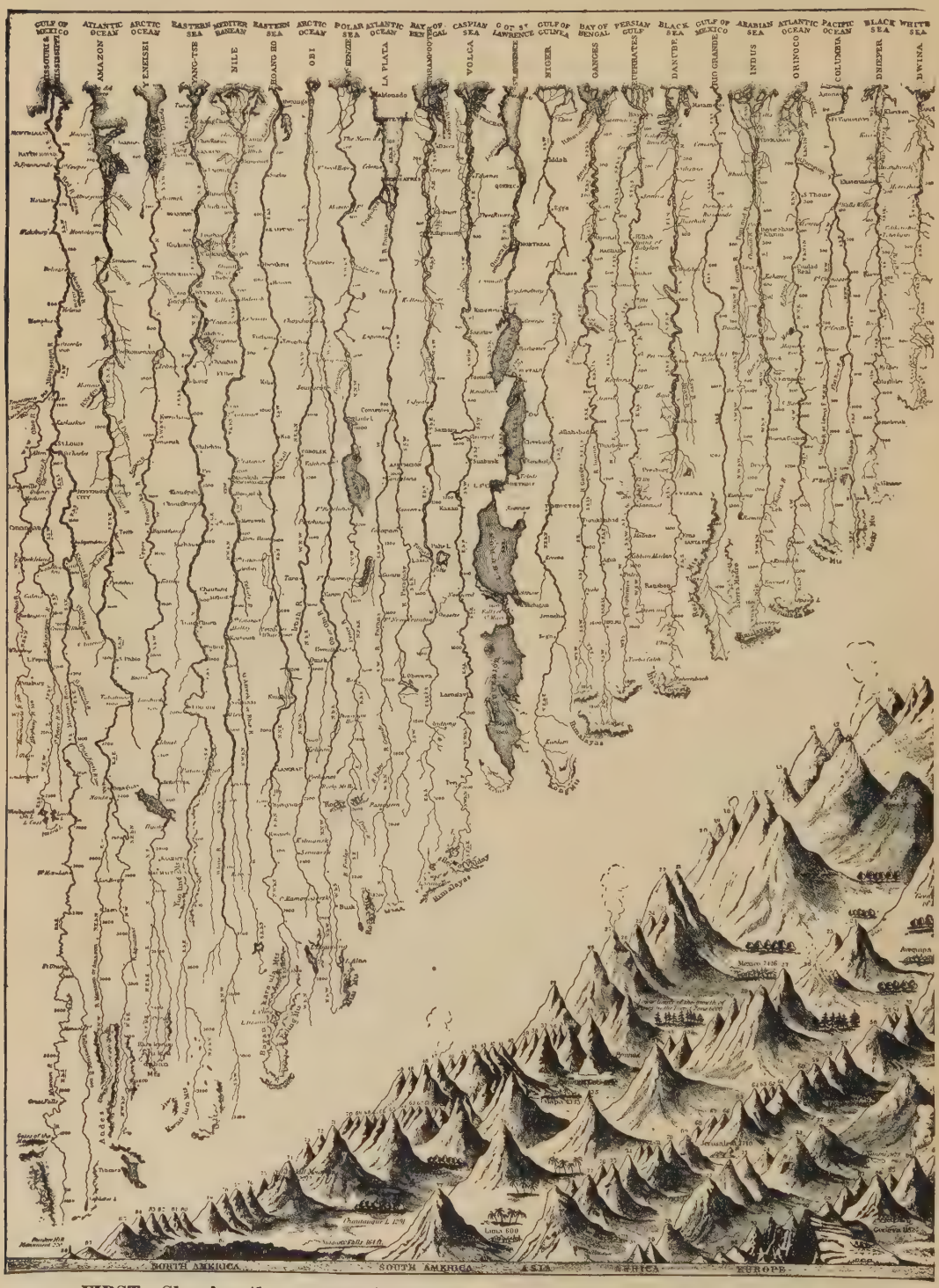
RIVER	Length in Miles	Emptying Into	Area of Drainage in Square Miles, etc.
Mississippi-Missouri (United States)	4,330	Gulf of Mexico	1,245,000
Amazon (Brazil); the only large river with direct latitudinal course	3,500	At Ocean on the Equator	2,700,000
Nile (Egypt)	3,300	Mediterranean	1,050,000
Yangtse-Kiang (China)	3,000	Yellow Sea	548,000
Congo (Central Africa)	2,900	Atlantic Ocean	1,430,000
Lena (Russia in Asia)	2,800	Arctic Ocean	856,000
Amur (Russia in Asia)	2,800	Gulf of Saghalin	772,000

THE GREAT RIVERS OF THE WORLD — Continued

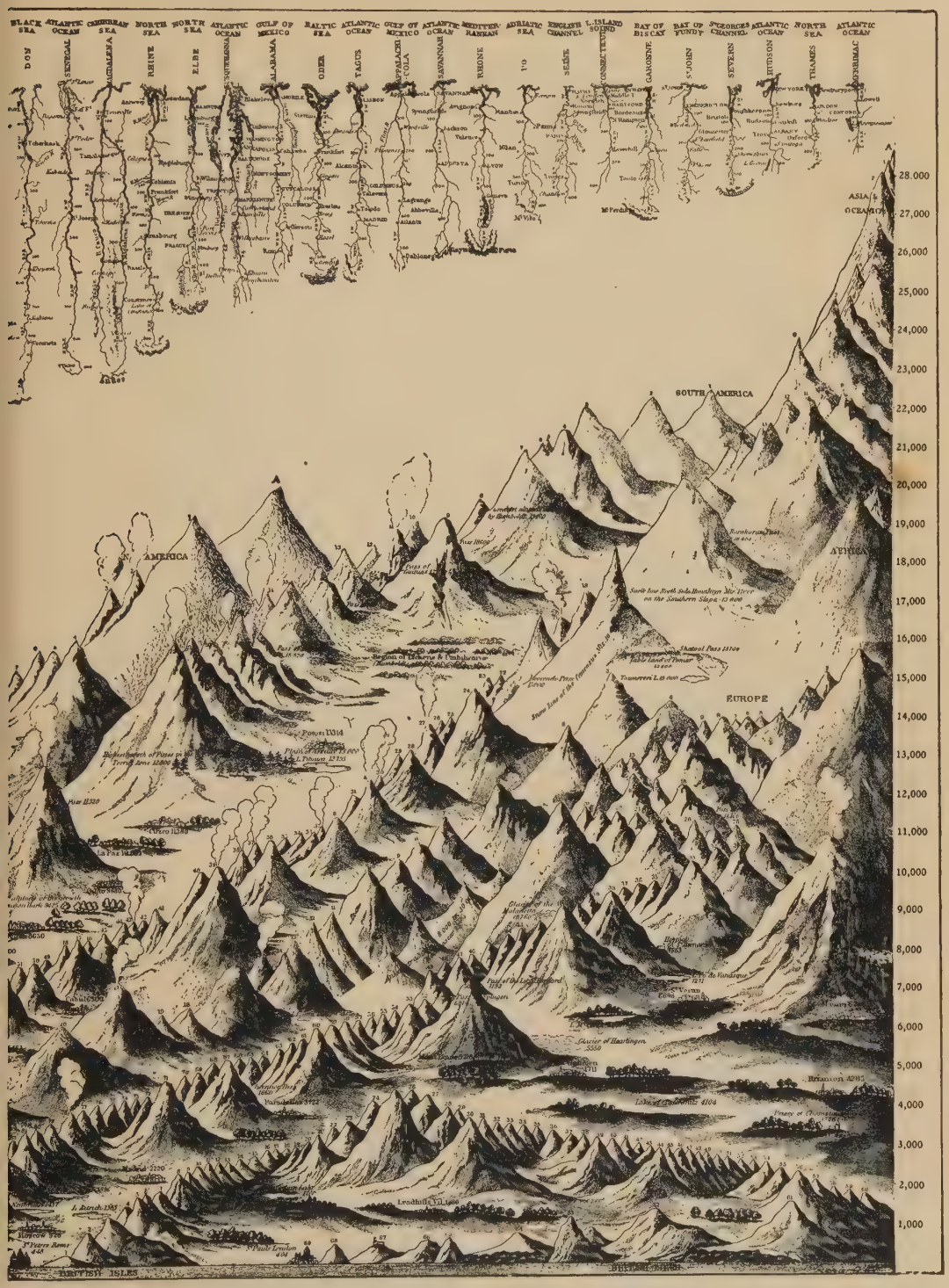
RIVER	Length in Miles	Emptying Into	Area af Drainage in Square Miles, etc.
Mekong (Indo-China)	2,800	China Sea	Nav. 200 miles
Yenisei (Russia in Asia)	2,700	Bay of Yenisei	1,000,000
Niger (West Africa)	2,600	Atlantic Ocean	808,000
Hoangho (China)	2,500	Gulf of Pe-Chi-Li	376,400
Obi (Russia in Asia)	2,300	Gulf of Obi	1,125,000
Plata-Parana (Argentina and Brazil)	2,300	Atlantic Ocean	2,300,000
Mackenzie (Canada)	2,300	Arctic Ocean	676,000
Volga (Russia in Europe)	2,200	Caspian Sea	560,000
St. Lawrence (United States and Canada)	2,200	Gulf of St. Lawrence	500,000
Yukon (Alaska)	2,200	Behring Sea	500,000
Indus (India)	2,000	Arabian Sea	373,000
Sao Francisco (Brazil)	1,800	Atlantic Ocean	249,000
Sir Daria (Turkestan)	1,800	Sea of Aral	175,000
Brahmaputra or Burrampooter (India)	1,800	Bay of Bengal	Nav. 800 miles
Rio Grande del Norte (U. S. and Mexico)	1,800	Gulf of Mexico	240,000
Danube (Austria-Hungary)	1,780	Black Sea	311,000
Saskatchewan-Nelson (Canada)	1,732	Hudson Bay	730,000
Euphrates (Turkey in Asia)	1,700	Persian Gulf	260,000
Zambesi (East Africa)	1,600	Indian Ocean	800,000
Ural (Russia in Europe)	1,500	Caspian Sea	85,000
Arkansas (United States)	1,500	Mississippi River	181,000
Orinoco (Colombia and Venezuela)	1,500	Atlantic Ocean	364,000
Ganges (India)	1,500	Bay of Bengal	409,000
Amu (Turkestan)	1,400	Sea of Aral	174,000
Columbia (United States)	1,400	Pacific Ocean	260,000
Dnieper (Russia in Europe)	1,400	Black Sea	203,000
Murray (Australia)	1,400	Indian Ocean	351,000
Don (Russia in Europe)	1,300	Sea of Azov	166,000
Orange (S. W. Africa)	1,200	Atlantic Ocean	370,000
Irawaddy (East India)	1,200	Indian Ocean	Nav. 800 miles
Colorado (United States)	1,100	Gulf of California	250,000
Senegal (West Africa)	1,100	Atlantic Ocean	270,000
Tigris (Turkey in Asia)	1,000	Euphrates and Persian Gulf	Nav. generally for small boats
Ohio (United States)	970	Mississippi River	201,000
Churchill (Canada)	900	Hudson Bay	Nav. by canoes
Magdalena (Colombia)	840	Caribbean Sea	Nav. 600 miles
Rhine (Germany)	800	North Sea	76,000
Cambia (West Africa)	750	Atlantic Ocean	Nav. 300 miles
Elbe (Germany)	720	North Sea	57,000
Fraser (British Columbia)	650	Gulf of Georgia	Nav. generally for small boats
Vistula (Germany, Poland)	600	Baltic Sea	120,000
Sacramento (United States)	600	Pacific Ocean	Nav. 300 miles
Tagus (Portugal)	570	Atlantic Ocean	32,000
Paranahiba (Brazil)	530	Atlantic Ocean	Nav. 400 miles
Guadiana (Spain)	510	Mediterranean Sea	32,000
Rhone (France)	500	Gulf of Lyons	38,000
Seine (France)	480	English Channel	30,000
Ebro (Spain)	470	Mediterranean Sea	32,000
Susquehanna (United States)	450	Chesapeake Bay	Not navigable
Potomac (United States)	450	Chesapeake Bay	Nav. to Washton, D. C.
Oder (Germany)	440	Baltic Sea	43,000
Po (Italy)	420	Adriatic Sea	29,000
Garonne (France)	380	Bay of Biscay	33,000
Hudson (United States)	350	New York Bay	Nav. to Troy; 150 miles
Loire (France)	200	Bay of Biscay	25,000
Thames (England)	200	North Sea	5,250

Deltas and Estuaries. Owing to local peculiarities at the mouths of rivers, accumulations of sedimentary matter take place in the middle of the stream, dividing it into two or more branches. By these depositions *deltas* (so called from the Greek letter (△) delta) are formed—many of them, as

PICTURE DIAGRAM GIVING A COMPARATIVE VIEW



FIRST: Showing the comparative length of the rivers; where and how they take their rise; where and how they empty; their chief branches and connected lakes; and the principal cities located on their banks.



SECOND: Comparative height of mountains, arranged in groups by continents, showing the relative height of both mountains and continents. See next page for LOCATION and HEIGHT IN FEET of the various mountain peaks.

those of the Mississippi and Orinoco and of the Rhine and the Ganges, being of great extent. Some rivers fall into the ocean through *estuaries* or wide channels, and are subject to a great swell or sudden rise of the waters when the tide enters.

Most rivers are subject to an occasional, and in some instances to a periodical increase of volume. These seasons of flood are by no means regular, being partly dependent on the melting of the snows, and partly on occasional heavy falls of rain; and hence depend on the climatic variations of the country in which rivers originate.

FAMOUS MOUNTAIN AND OTHER ELEVATIONS OF THE WORLD

NOTE: The numbers refer back to the Picture Diagrams on the preceding page.

NORTH AMERICA

Ref. No.	Name and Location	Height in Feet
A	*Mount McKinley, Coast Range, Alaska	20,300
1	Orizaba, Cordillera, Mexico	18,310
2	Mount St. Elias, Coast Range, Alaska	18,024
3	Popocatapetl, Cordillera, Mexico	17,748
4	Mount Brown, Rocky Mountains, Canada	15,990
5.	Mount Hooker, Rocky Mountains, Canada	15,700
6.	Mount Fairweather, Coast Range, Alaska	14,750
7.	*Mount Rainier, Coast Range, Washington	14,408
8.	*Mount Whitney, Coast Range, California	14,501
9.	Mount Elbert, Rocky Mountains, Colorado	14,402
10.	Pike's Peak, Rocky Mountains, Colorado	14,108
11.	*Gannett Peak, Rocky Mountains, Wyoming	13,785
12.	Fremont's Peak, Rocky Mountains, Wyoming	13,570
13.	*Kings Peak, Utah	13,498
14.	*N. Truchas Peak, Rocky Mountains, New Mexico	13,306
15.	*E. Peak, White Mountains, Nevada	13,145
16.	*Granite Peak, Rocky Mountains, Montana	12,850
17.	*San Francisco Peak, Arizona	12,611
18.	Mount Assiniboine, Rocky Mts., Canada	11,860
19.	*Mount Hood, Coast Range, Oregon	11,225
20.	*El Capitan, Texas	9,020
21.	Mount Potrillo, Cuba	9,000
22.	Cibao Mountains, Hayti, West Indies	8,970
23.	*Harvey Peak, South Dakota	7,242
24.	Sierra del Cobre, Cuba	7,200
25.	*Mount Mitchell, Allegheny Mts., N. C.	6,711
26.	*Mount Guyot, Allegheny Mts., Tennessee	6,636
27.	Black Mountain, Allegheny Mts., N. C.	6,476
28.	*Mount Washington, White Mts., N. H.	6,293
29.	Roan Mountain, Allegheny Mts., N. C.	6,038
30.	Mount Adams, White Mts., N. H.	5,963
31.	Mount Jefferson, White Mts., N. H.	5,725
32.	*Mount Rogers, Blue Ridge, Virginia	5,719
33.	Mount Monroe, White Mts., N. H.	5,390
34.	*Banner Peak, Nebraska	5,350
35.	*Mount Marcy, Adirondacks, New York	5,344
36.	*Mount Katahdin, Maine	5,273
37.	Mount McIntyre, Adirondacks, New York	5,112
38.	Mount Hecla, Iceland	5,110
39.	Mount Franklin, White Mts., N. H.	5,050
40.	Skylight, Adirondacks, New York	4,920
41.	Haystack, Adirondacks, New York	4,918
42.	Morne Garon, St. Vincent, West Indies	4,800
43.	*Spruce Knob, West Virginia	4,860
44.	*Brasstown Bald, Georgia	4,768
45.	*Cimarron Peak, Oklahoma	4,750
46.	Mount Lafayette, White Mts., N. H.	4,723
47.	Mount Morris, Adirondacks, New York	4,576
48.	Mount Pelée, Martinique	4,300
49.	*Mount Mansfield, Green Mts., Vermont	4,364
50.	Otter Peak, Allegheny Mountains, Virginia	4,260
51.	*Highlands (West Boundary), Kansas	4,135
52.	*Big Black Mountain, Kentucky	4,100
53.	Killington, Green Mountains, Vermont	4,100
54.	Mount Seward, Adirondacks, New York	4,000
55.	Table Mountain, Allegheny Mts., Virginia	4,000
56.	*Bald Mountain, Allegheny Mts., Virginia	4,000
57.	Mount Parnassus, Spitzbergen	3,951
58.	Round Top, Catskills, New York	3,804
59.	High Peak, Catskills, New York	3,718
60.	Mount Misery, St. Christopher, West Indies	3,712
61.	Sierra de Luquillo, Porto Rico	3,678
62.	Mount Greylock, Taconic Mts., Mass.	3,505
63.	*Monadnock, White Mts., New Hampshire	3,450
64.	*Bowman Summit	3,500
65.	Backbone Mountain, Maryland	3,340
66.	*Blue Knob, Allegheny Mts., Pennsylvania	3,136
67.	Central Peak, Nevis, West Indies	3,000
68.	*Blue Mountain, Arkansas	2,800
69.	Kearsarge, White Mts., New Hampshire	2,460
70.	*Cheaha Mountain, Alabama	2,407
71.	*Bear Mountain, Connecticut	2,355
72.	*Rib Hill, Wisconsin	1,940
73.	*Mesabi Range, Minnesota	1,920
74.	High Point, New Jersey	1,809
75.	Pringhar, Iowa	1,800
76.	Taun Sauk Mountain, Ozarks, Missouri	1,750
77.	*Logan Summit, Ohio	1,550
78.	West Point, Highlands, New York	1,500
79.	Storm King, Highlands, New York	1,389
80.	*Charles Mound, Illinois	1,241
81.	Carlos Summit, Indiana	1,210
82.	Mount Tom, Massachusetts	1,200
83.	Berkshire Hills, Massachusetts	1,200
84.	Anthony's Nose, Highlands, New York	1,048
85.	Mount Holyoke, Massachusetts	830
86.	Palisades of Hudson, New York and N. J.	500
87.	Mount Hope, Rhode Island	300
88.	Bunker Hill, Massachusetts	62

*Greatest altitude in the state or territory.

EUROPE

1.	Mont Blanc, France	15,782
2.	Monte Rosa, Italy	15,217
3.	Weisshorn, Switzerland	14,808
4.	Matterhorn, or Cervin, Switzerland	14,780
5.	Finsteraarhorn, Switzerland	14,026
6.	Breithorn, Switzerland	13,685
7.	Jungfrau, Switzerland	13,671
8.	Mönch, Switzerland	13,465
9.	Pic des Ecrins, France	13,462
10.	Shreckhorn, Switzerland	13,385
11.	Mount Paradis, France	13,300
12.	Otherspitze, Austria	12,800
13.	Gross Glockner, Austria	12,776
14.	Aiguille du Midi, France	12,743
15.	Monte Viso, France	12,582
16.	The Gallonstock, Switzerland	12,481
17.	Aiguille de Sassire, Sardinia	12,346
18.	Wetterhorn, Switzerland	12,150
19.	Mont Genevre, Sardinia	11,785
20.	Monto Gavio, Austria	11,754
21.	Cerro de Mulhacen, Spain	11,605
22.	Simplon, Switzerland	11,541
23.	Wisbach Horn, Austria	11,518
24.	La Mormelata, Austria	11,508
25.	Mont Cenis, France	11,457
26.	Mont Nethou, Spain	11,427
27.	Pic Blanc, France	11,190
28.	Great St. Bernard, Switzerland	11,080
29.	Vignemale, France and Spain	10,980
30.	St. Gothard, Switzerland	10,595
31.	Mount Calm, France and Spain	10,500
32.	Pic Blanc, France and Spain	10,205
33.	Splugen, Switzerland and Austria	9,981
34.	Peak of Oo, France and Spain	9,730
35.	Pic du Midi, France	9,650
36.	Mount Etna, Island of Sicily	9,652
37.	The Thorstein, Austria	9,630
38.	Little St. Bernard, France	9,591
39.	Monte Corno, Italy	9,523
40.	Canigon, France	9,137
41.	Monte Rotondo, Island of Corsica	9,065
42.	Guiona, Greece	8,620
43.	Lomnitzer Spitze, Austria	8,779
44.	Rilo Dagh, Bulgaria	8,300
45.	Mount Parnassus, Greece	8,000
46.	Mount St. Elias, Greece	7,946
47.	Mount Ida, Crete	7,674
48.	Col de Ferret, Switzerland	7,641
49.	Mount Dinara Austria-Hungary	7,458
50.	Monte Cimone, Italy	7,083

FAMOUS MOUNTAIN AND OTHER ELEVATIONS OF THE WORLD — Continued

EUROPE—Continued

Ref. No.	Name and Location	Heigth in Feet
51.	Mount Kleck, Austria-Hungary	6,926
52.	Pisanino, Italy	6,723
53.	Pizzo di Casi, Sicily	6,509
54.	Oraefa Yokul, Iceland	6,420
55.	Kissovo, Bulgaria	6,407
56.	Genargentu Peak, Sardinia Island	6,290
57.	Mount D'or, France	6,188
58.	Mount Pierus, Bulgaria	6,161
59.	P. de Cantal, France	6,093
60.	Sulitelma, Sweden and Norway	5,956
61.	Monte Amiata, Tuscany	5,792
62.	Recullet de Toiry, Switzerland	5,643
63.	La Dole, Switzerland	5,509
64.	Black Mountain, Island of Cephalonia, Greece	5,356
65.	Zagora, Bulgaria	5,310
66.	St. Angelo, Lipari Island, Sicily	5,260
67.	Schneekoppe. Germany	5,253
68.	Feugari, Samothraki Island, Turkey	5,248
69.	Feldberg, Black Forest, Germany	4,900
70.	Puy de Dome, France	4,846
71.	Ballon de Alsace, France	4,688
72.	Monte Alto, Italy	4,380
73.	Hohenstein, Austria	4,284
74.	Brokfeld, Norway	4,188
75.	Mount Delphi, Island of Negropont, Greece	4,156
76.	Kielburg, Erz Gebirge, Germany	4,074
77.	Monserrat, Spain	4,054
78.	Vesuvius, Italy	4,260
79.	Brocken, Harz Mountains, Germany	3,740
80.	Ispario, Thasos Island, Greece	3,428
81.	Great Beerberg, Thuringerwald, Germany	3,265
82.	Summit, Norway	3,200
83.	Great Feldsberg, Germany	2,886
84.	Stromboli, Lipari Island, Sicily	3,090
85.	Mount Delphi, Skopela Island, Greece	2,295
86.	Tonnere, France	2,225
87.	Mount St. Oreste, Italy	2,140
88.	Peak, Island of Corfu, Greece	1,900
89.	Kastri, Island of Thasos, Greece	1,565
90.	Gibraltar, Spain	1,437
91.	Valdai Hills, Russia	1,200
92.	North Cape, Island of Mageroe, Norway	1,161
93.	Himmelsberg, Plateau of Denmark, Denmark	928
94.	Montmartre, Paris, France	400
95.	Observatory, Paris, France	240
96.	Heligoland Island, North Sea, Germany	230

BRITISH ISLES

1.	Greenwich, Observatory Kent, England	214
2.	Holyhead, Island of Anglesea, Wales	709
3.	Carraton, Cornwall, England	1,208
4.	Penmaen Maur, Wales	1,540
5.	Axedge, Derby, England	1,750
6.	Pendlehill, Lancashire, England	1,803
7.	Holmernoss, Derby, England	1,859
8.	Ingleborough, Yorkshire, England	2,361
9.	Whernside, Yorkshire, England	2,384
10.	Plinlimmon, Cardiganshire, Wales	2,463
11.	Cradle Mountain, Brecknockshire, Wales	2,545
12.	Coniston Fell, Westmoreland, England	2,577
13.	Caermarthen Vau, Caermarthenshire, Wales	2,596
14.	Chevoit, Northumberland, England	2,684
15.	Grassmere Fell, Cumberland, England	2,756
16.	Cross Fell, Cumberland, England	2,909
17.	Bow Fell, Cumberland, England	2,911
18.	Cader Idris, Merionethshire, Wales	2,914
19.	Arran Mowdwy, Merionethshire, Wales	2,955
20.	Skiddaw, Cumberland, England	3,022
21.	Helvellyn, Cumberland, England	3,313
22.	Carnedd Llewellyn, Caernarvon, Wales	3,471
23.	Snowdon, Caernarvon, Wales	3,571
24.	Cairn Gorm, Invernesshire, Scotland	4,095
25.	Ben Macdui, Aberdeenshire, Scotland	4,305
26.	Ben Nevis, Inverness, Scotland	4,368
27.	Cairntoul, Aberdeenshire, Scotland	4,245
28.	Ben Lawers, Perthshire, Scotland	3,945
29.	Ben More, Perthshire, Scotland	2,944
30.	Ben Gloe, Perthshire, Scotland	3,690
31.	Ben Cruachan, Argyleshire, Scotland	3,669
32.	Ben Deirg, Perthshire, Scotland	3,550
33.	Schehallien, Perthshire, Scotland	3,514
34.	Macgillicuddy Reeks, Kerry, Ireland	3,404
35.	Scarscoch, Aberdeenshire, Scotland	3,402
36.	Ben Gurdy, Perthshire, Scotland	3,364
37.	Ben More, Sutherlandshire, Scotland	3,231
38.	Ben Lomond, Stirlingshire, Scotland	3,180
39.	Ben Voirlich, Perthshire, Scotland	3,055
40.	Lunaquilla, Wicklow, Ireland	3,039
41.	Galtee Mountains, Tipperary, Ireland	3,008
42.	Slatterwind, Stromoe, Faroe Islands	2,998
43.	Black Larg, Ayrshire, Scotland	2,890
44.	Goat Fell, Island of Arran, Scotland	2,865
45.	Ben Ledi, Perthshire, Scotland	2,863
46.	The Cobbler, Argyleshire, Scotland	2,863
47.	Slievedonard, Ulster, Ireland	2,796
48.	Broad Law, Pebblshire, Scotland	2,741
49.	Ben Wyvis, Rosshire, Scotland	2,720
50.	Hart Fell, Dunfriesshire, Scotland	2,635
51.	Mount Battock, Kincardineshire, Scotland	2,600
52.	Lowther Hill, Lanarkshire, Scotland	2,522
53.	Kippure, Leinster, Ireland	2,473
54.	Paps of Jura, Argyleshire, Scotland	2,470
55.	Slievenaman, Tipperary, Ireland	2,362
56.	The Paps, Kerry, Ireland	2,280
57.	Snaefell, Isle of Man, Great Britain	2,004
58.	Campsie Hills, Stirlingshire, Scotland	1,850
59.	Achil Head, Mayo, Ireland	1,800
60.	Pentland Hills, Scotland	1,700
61.	Peak, Hoy Island, Orkney Group	1,569
62.	Eildon Hills, Roxburgshire, Scotland	1,364
63.	Ailsa Craig, Firth of Clyde, Scotland	1,139
64.	Dunnose, Isle of Wight, England	792
65.	Salisbury Craigs, Mid Lothian, Scotland	550
66.	Hill of Howth, Dublin, Ireland	549
67.	Edinburg Castle, Mid Lothian, Scotland	434
68.	Bass Rock, Firth of Forth, Scotland	400
69.	St. Paul's, London, England	404

ASIA AND PACIFIC ISLANDS

A.	Mount Everest, India-China	29,002
1.	Godwin-Austin, India-China	28,278
2.	Dapsang, Tibet	28,273
3.	Kanchanjanga, India-China	28,156
4.	Nanga-Parbat, India	26,629
5.	Dhawalaghiri, India	26,286
6.	Nanda-Devi, India	25,661
7.	Bride Peak, India	25,100
8.	Chumolhari, India	23,933
9.	Kaufmann, Turkestan	23,000
10.	Cantas, India-China	22,500
11.	St. Patrick, India-China	22,385
12.	St. George, India-China	22,240
13.	Gemini, India-China	21,600
14.	Bunderpooch, India-China	21,155
15.	Pyramid, India-China	20,966
16.	Peak, Hindu Kush, Afghanistan	20,230
17.	Bunderpooch 2d, India	20,122
18.	Mount Elburz, Russian Empire	18,526
19.	Mount Ararat, Asia Minor	17,160
20.	Mount Kasbeck, Russian Empire	16,592
21.	Kliontsheoskoi, Kamtschatka	16,512
22.	Kassoumba, Sumatra, Malaysia	15,000
23.	Australian Alps, Australia	15,000
24.	Demavend, Persia	18,500
25.	Mouna Kea, Hawaii, Hawaiian Islands	13,953
26.	Mount Ophir, Sumatra, Malaysia	13,842
27.	Mouna Loa, Hawaii, Hawaiian Islands	13,600
28.	Arjish Dagh, Asia Minor	13,100
29.	Sevellan, Persia	13,000
30.	Gunong Dempu, Sumatra, Malaysia	12,465
A.	Mount Erebus, Victoria Land, Antarctic Continent	12,400
31.	Peak, Formosa, Japan	12,000
B.	Mount Terror, Victoria Land, Antarctic Continent	11,500
32.	Koriatskaia, Kamtschatka	11,215
33.	Mount Lebanon, Syria	11,050
34.	Mount Bielucha, Russian Empire	11,063
35.	Peak, Otaheite, Polynesia	10,895
36.	Italitskui, Russian Empire	10,735
37.	Kriontskaia, Kamtschatka	10,625
38.	Shivelutsh, Kamtschatka	10,591
39.	Haleakala, Maui, Hawaiian Islands	10,200
40.	Murtchurti Bet, India	10,070
41.	Mount Olympus, Asia Minor	9,100
42.	Mount Egmont, New Zealand	8,839
43.	Arvatskaa, Kamtschatka	8,760
44.	Dodabetta, India	8,760
45.	Mount St. Catherine, Arabia	8,593
46.	Mount Sinai, Arabia	8,300
47.	Pedro-talla-galla, Ceylon	8,326

FAMOUS MOUNTAIN AND OTHER ELEVATIONS OF THE WORLD — Continued

ASIA AND PACIFIC ISLANDS—Continued

Ref. No.	Name and Location	Height in Feet
48.	Melin, China	8,200
49.	Kirrigal Pota, Ceylon	7,810
50.	Totta Rella, Ceylon	7,720
51.	Peak of Yeddo, Japan	7,680
52.	Adams' Peak, Ceylon	7,420
53.	Mount Serbal, Arabia	6,760
54.	Quelpaert, Quelpaert Island	6,400
55.	Sea View Hill, Australia	6,300
56.	Taddiamdamala, India	6,055
57.	Subramain, India	5,560
58.	Jebel, Akral, Arabia	5,318
59.	Abu, India	5,100
60.	Mount Ida, Asia Minor	4,960
61.	Peak of Teneriffe, Tasmania	4,500
62.	Mount Williams, Australia	4,500
63.	Corean Mountains, Japan	4,480
64.	Baskirian Urals, Russian Empire	4,400
65.	Ben Lomond, Tasmania	4,200
66.	Mount Wellington, Tasmania	3,795
67.	Forest Hill Peak, Australia	3,776
68.	Quamby's Bluff, Tasmania	3,500
69.	Karnalighur, India	3,203
70.	Mount York, Australia	3,192
71.	Mount Exmouth, Australia	3,000
72.	Mount Cole, Australia	3,000
73.	Mount Field, Tasmania	3,000
74.	Peak, St. Paul's Island, Indian Ocean	2,760
75.	Sugar Loaf, Peak, Australia	2,527
76.	St. Paul's Dome, Tasmania	2,500
77.	Mount Carmel, Palestine, Syria	2,250
78.	Mount Tabor, Palestine, Syria	2,053
79.	Bathurst Heights, Australia	1,970

AFRICA

Ref. No.	Name and Location	Height in Feet
1.	Kilimanjaro, East Africa	19,780
2.	Kibo Peak, German East Africa	19,320
3.	Mount Kenia, British Africa	17,200
4.	Mount Stanley, Central Africa	16,800
5.	Abba Yared, Abyssinia	15,200
6.	Bushad, Abyssinia, Central Africa	14,364
7.	Mongo-ma-Lobah, Central Africa	13,760
8.	Peak of Teneriffe, Canary Islands	12,000
9.	Mount Miltsen, North Africa	11,400
10.	Clarence Peak, Fernando Po Island, Gulf of Guinea	10,655
11.	Pic Nieges, Bourbon Island, Indian Ocean	10,355
12.	Spitz-Kop, South Africa	10,240
13.	Mount Alantika, Central Africa	9,000
14.	Tarami, Abyssinia	8,643
15.	Peak, Tristan de'Acunha Island, Atlantic Ocean	8,236
16.	Peak of Pico, Azores, Atlantic Ocean	7,013
17.	Volcano Fogo, Cape de Verd Islands, Atlantic Ocean	7,884
18.	El Cumbre, Canary Islands, Atlantic Ocean	6,648
19.	Jebel Akhal, East Africa	6,500
20.	Pico Ruivo, Madeira Island, Atlantic Ocean	6,056
21.	Mount Dogen, Central Africa	5,000
22.	Table Mountain, South Africa	3,582
23.	Devil's Peak, South Africa	3,315
24.	Green Mountain, Ascension Island, Atlantic Ocean	2,868
25.	Mount Tekut, North Africa	2,800
26.	Diana's Peak, St. Helena, Atlantic Ocean	2,692
27.	Lion's Head, South Africa	2,166
28.	Cape, Cape Colony, South Africa	1,000
29.	Pyramid of Cheops, Egypt	479
30.	Pyramid of Chephren, Egypt	456

SOUTH AMERICA

Ref. No.	Name and Location	Height in Feet
1.	Aconcagua, Chile	23,080
2.	Sorata or Illampu, Bolivia	23,000
3.	Mercedario, Argentina	22,312
4.	Illimani, Bolivia	22,200
5.	Tupungato, Chile	21,550
6.	Condor, Argentina	21,128
7.	Famatina, Argentina	20,680
8.	Salcantay, Peru	20,540
9.	Chimborazo, Ecuador	20,475
10.	Antisana, Ecuador	19,184
11.	Santa Morta, Colombia	19,030
12.	Tacora, Bolivia	19,000
13.	Cotopaxi, Ecuador	18,880
14.	Arequipa, Peru	18,370
15.	Tolima, Colombia	18,069
16.	Maispo, Chile	17,670
17.	Peak of Cuzco, Peru	17,525
18.	Sangai, Ecuador	17,460
19.	Ruiz, Colombia	17,388
20.	Tunguraqua, Ecuador	16,690
21.	Cotocachi, Ecuador	16,300
22.	Cerro de Potosi, Bolivia	16,037
23.	Pichincha, Ecuador	15,918
24.	Roraima, Venezuela	8,740
25.	Silla de Caracas, Venezuela	8,632
26.	Duida, Venezuela	8,467
27.	Corcorada, Argentina	7,510
28.	Minchinmadiva, Argentina	7,046
29.	Mount Sarmiento, Tierra del Fuego	7,000
30.	Mount Darwin, Tierra del Fuego	6,800
31.	Guadarrama, Colombia	6,400
32.	Itambe, Brazil	5,960
33.	Piedade, Brazil	5,820
34.	Itacolumi, Brazil	5,750
35.	Morro dos Canudos, Brazil	4,476
35.	Macarapan, Guayana	3,500
37.	Cape Horn, Argentina	1,870

FRESHWATER AND SALT LAKES

Lakes are of different kinds. Some are mere tanks which receive the first outpourings of springs, others consist of basins or reservoirs which occur in the line of a river's course; some consist of basins or cavities, into which rivers flow, but which, on account of their depression or their mountainous cincture have no outlets; lakes are also formed in the craters of extinct volcanoes; and some lakes are periodic, or subject to have their basins alternately empty and full of water.

MOUNTAIN LAKES, which are valleys or chasms filled by streams, are long and narrow, rarely of extensive area, but often of great depth. Examples of this class are found in Lakes Champlain and George, among the Appalachian Mountains; Lakes Constance and Geneva, on the northern side of the Alps; and Lake Maggiore and Lake Como, on the south side; all of which are renowned for the loveliness of their shores, or the grandeur of the surrounding mountain scenery.

Lake Maggiore, which is hardly three miles wide, is, according to Italian engineers, 2,623 feet deep—more than double the depth of Lake Superior—its basin reaching 1,936 feet below the sea level.

The forms of mountain lakes are very irregular, for the water often covers several contiguous and connected valleys. This is the case in Lake Como, which has two long arms; and Lakes Lucerne

and Lugano, each of which fills four distinct valleys, meeting one another nearly at right angles.

Lakes in Plains. The lake basins in plains and plateaus are, usually, simple depressions in a comparatively uniform surface. The lakes are therefore, often of great size, broad in proportion to their length, but of little depth compared with their area.

The largest lakes of the globe—the Caspian and Aral seas, and the great North American and African lakes—and the largest in Europe and South America, all belong to this class. Their vast expanse, together with the tameness of their shores, deprives them of the picturesque beauty of mountain lakes.

Characteristics of Salt Lakes. Numerous lakes in the interior of the continents, though receiving affluents, have no outlet. Their waters are chiefly lost by evaporation, though some portion may be absorbed by the sandy soil.

The surfaces of the continents having been the beds of the primeval oceans, the presence of salt in the soil is a natural consequence.

Famous Salt Lakes. The Great Salt Lake of Utah, in the Great American Basin, is one of the finest examples of its class. The Caspian and Aral seas, at the bottom of the vast depression between Europe and Asia, are the most extensive salt lakes. The former has about four times the area of Lake Superior; and the latter is a little larger than Lake Michigan.

The Caspian, though receiving the Volga, the largest river of Europe, evaporates so much water that its surface is about 83 feet lower than that of the Mediterranean, varying with the seasons. Many lakes in its neighborhood disappear entirely in the heat and drought of summer, leaving their beds covered with a crust of pure white crystalline salt.

The Remarkable Dead Sea, in Syria, is a lake in which the salt has accumulated until the water is converted into a heavy brine. It may be the remnant of an ancient sea of much greater extent, which has been gradually reduced in size by the excess of evaporation over the supply of water in its basin.

This celebrated body of water lies in the deepest part of a long chasm or valley, which is sunk not less than 4,000 feet below the level of the surrounding country. The surface of the lake is 1,286 feet, and its bottom 2,500 feet, below the level of the Mediterranean.

Its feeder, the river Jordan, flows almost throughout its entire course below the level of the sea, the only known instance of the kind. The beautiful lake of Tiberias, the scene of so many of the miracles of Jesus, which is but an expansion of the Jordan in its upper course, is about 650 feet below the surface of the Mediterranean.

How the Lakes are Distributed over the Globe

Lakes are most numerous in the central and northern portions of Asia, Europe and North America. The southern continents, except Africa, have comparatively few.

Asia is pre-eminently the continent of salt lakes. They occur in countless numbers, both in the steppes north of the Caspian and Aral, and in all the interior plateaus. Lakes of fresh water are also found among the Altai Mountains and adjacent chains. Lake Baikal, one of these, is the largest mountain lake known, being nearly 500 miles long.

Europe. The most characteristic and celebrated lakes are those which adorn the Alps of Switzerland and Scandinavia, and the less lofty mountain chains of the British Isles. But the largest lakes are found in the low lands and slight swells which surround the Baltic Sea, in western Russia and Sweden. Lakes Ladoga and Onega in Russia, and Wener and Wetter in Sweden, are the largest in Europe.

North America is peculiarly rich in great lakes. No continent presents a more remarkable series than that which stretches from northwest to southeast, through the central plains, along the line of contact of the oldest geological formations of the continent. This series includes Great Bear and Great Slave lakes, Athabasca and Winnipeg, and the five great lakes of the St. Lawrence, with many of less area.

Innumerable small lakes are scattered throughout the middle portions of the central plain, and the northern and less regular part of the Appalachian mountain region; but south of the parallel of Lake Erie there is an almost entire absence of lakes, whether large or small.

Relative Size of Lakes of the Western Hemisphere

PRINCIPAL SALT-WATER LAKES OF THE WORLD

NAME	Location	Area in Square Miles	Mean Elevation in Feet
Black Sea	Asia and Europe	170,000	Sea-level
Caspian Sea	Asia	170,000	90 below sea-level
Sea of Aral	Asia	26,160	157 above sea-level
Balkash	Asia	7,135	779 above sea-level
Maracaibo	South America	6,315	0 above sea-level
Eyre	Australia	3,600	70 above sea-level
Titicaca (slightly saline)	South America	3,200	12,506 above sea-level
Issik-kul	Asia	2,250	5,300 above sea-level
Great Salt Lake	North America	2,177	4,218 above sea-level
Koko-nor	Asia	2,040	9,970 above sea-level
Urumiah	Asia	1,795	4,100 above sea-level
Van	Asia	1,400	5,200 above sea-level
Dead Sea	Asia	444	1,290 below sea-level
Ngami (nearly dried up)	Africa	297	2,919 above sea-level

Relative Size of Lakes of the Eastern Hemisphere

PRINCIPAL FRESH-WATER LAKES OF THE WORLD

NAME	Location	Area in Square Miles	Mean Elevation in Feet
Superior	North America	31,200	601 above sea-level
Victoria Nyanza	Africa	26,500	3,300 above sea-level
Huron	North America	23,800	581 above sea-level
Michigan	North America	22,450	581 above sea-level
Baikal	Asia	13,200	1,542 above sea-level
Tanganyika	Africa	12,000	2,756 above sea-level
Great Bear	North America	11,200	391 above sea-level
Nyassa	Africa	10,230	1,706 above sea-level
Great Slave	North America	10,200	520 above sea-level
Erie	North America	9,960	573 above sea-level
Winnipeg	North America	9,400	710 above sea-level
Lake of the Woods	North America	7,650	1,060 above sea-level
Ontario	North America	7,240	247 above sea-level
Ladoga	Europe	6,998	49 above sea-level
Tchad	Africa	6,000 to 40,000	1,150 above sea-level
Athabasca	North America	4,400	690 above sea-level
Onega	Europe	3,760	237 above sea-level
Nicaragua	Central America	2,972	131 above sea-level
Wener	Europe	2,400	147 above sea-level
Albert Nyanza	Africa	1,780	2,230 above sea-level
Dembea	Africa	1,000	6,100 above sea-level
Wetter	Europe	936	288 above sea-level
Champlain	North America	750	96 above sea-level
Managua	North America	560	154 above sea-level

PRINCIPAL FRESH-WATER LAKES OF THE WORLD—Continued

NAME	Location	Area in Square Miles	Mean Elevation in Feet
Bangweolo	Africa	400 to 5,800	3,690 above sea-level
St. Clair	North America	396	576 above sea-level
Balaton (Platten See)	Europe	266	426 above sea-level
Geneva (or Leman)	Europe	214	1,220 above sea-level
Constance (or Boden See)	Europe	208	1,308 above sea-level
Garda	Europe	136	213 above sea-level
Neuchatel	Europe	90	1,424 above sea-level
Maggiore	Europe	78	646 above sea-level
Cayuga	North America	76	381 above sea-level
George	North America	61	323 above sea-level
Como	Europe	56	649 above sea-level
Lucerne	Europe	40	1,435 above sea-level
Zurich	Europe	37½	1,340 above sea-level

Africa. The great plateau lakes are typical of the continent. The Victoria Nyanza and Albert Nyanza, feeding the White Nile; Tanganyika, whose outlet is unknown; Tzana, at the head of the Blue Nile; and Lake Nyassa, in the Zambezi basin, all rest on the high plateaus of Central Africa. Lake Tchad alone, among large African lakes, is surrounded by low plains.

Waterfalls and Rapids. The variations in the slope of a river-bed, arising from unequal erosion, or from the original irregularities in the surface, give rise to rapids and falls.

The first occur where an increased slope causes the stream to flow with more than its average velocity. The second are caused by nearly perpendicular rocky walls, down which the foaming water descends in picturesque cascades, or imposing cataracts.

The famous "Cataracts of the Nile' are merely rapids which impede but do not entirely obstruct, the navigation as cataracts must. The so-called Falls of St. Anthony, in the upper Mississippi, and the rapids of the St. Lawrence, above Montreal, are among the finest rapids in American rivers.

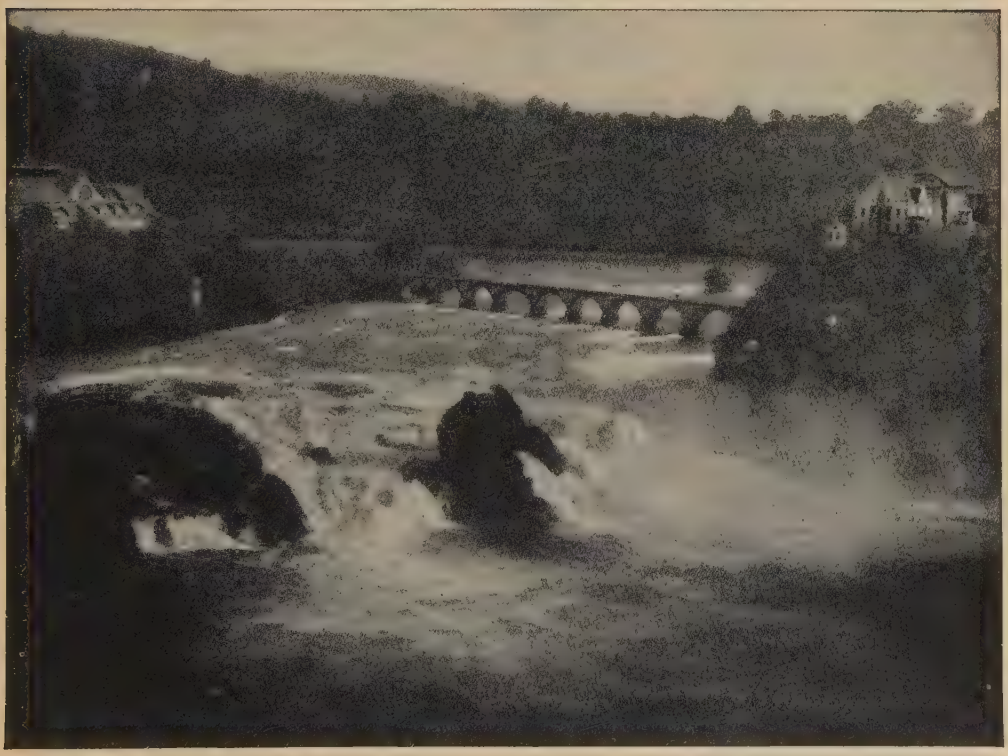
The highest falls are in the upper course of rivers, in mountainous regions; the greatest and most imposing, in their middle course.

The Niagara Falls exhibit a most important industrial utilization of water power. The Falls of St. Anthony in the Mississippi, the Falls of Foyers in Scotland, the Rhine falls, the Rhone falls of Bellegarde, and the innumerable waterfalls of Scandinavia, Switzerland, and similar mountainous lands, are all utilized in this way. It has been proposed to convey power generated at the Victoria falls of the Zambezi to the Rand goldfield of the Transvaal, and a scheme for this is now being prepared.

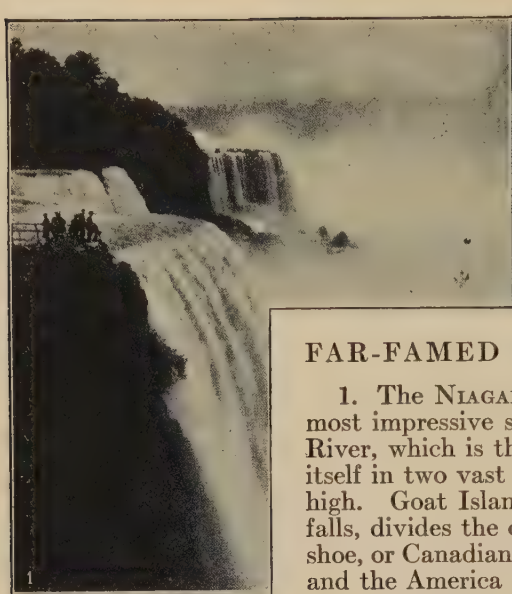
FAMOUS WATERFALLS OF THE WORLD

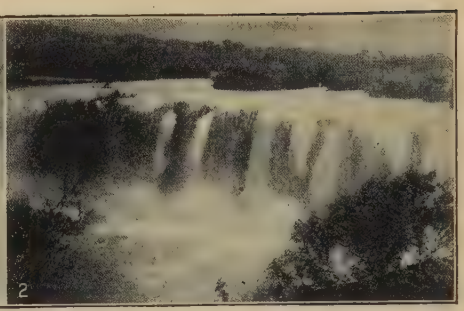
Name	Location	Height (feet)
Bridal Veil	California	900
Foyers	Great Britain	205
Gastein Falls	Austria	469
Gavarnie	Pyrenees	1,400
Genesee	New York	95
Grand Falls	Labrador	2,000
Great Falls	Montana	500
Hay River	Alaska	200
Kaieteur Falls	Guiana	740
Krimmler Falls	Austria	1,300
Kukenam Fall	Guiana	1,500
Maanelvan	Norway	940
Minnehaha	Minnesota	50
Missouri	Montana	90
Montmorenci	Quebec	265
Multnomah	Oregon	850
Murchison	Africa	120
Nevada Falls	California	600
Niagara	New York	165
Oroco Falls	Monte Rosa	2,400
Rjukanfos	Norway	804
Roraima Fall	Guiana	2,000
Rukaufos	Norway	513
St. Anthony	Minnesota	80
Schaffhausen	Switzerland	100
Seven Falls	Colorado	266
Shoshone	Idaho	210
Skykjefos	Norway	700
Snoqualmie	Washington	268
Staubbach	Switzerland	1,000
Stirling	New Zealand	500
Sutherland	New Zealand	1,904
Takkakaw	British Columbia	1,200
Tequendama	Colombia	475
Tessa Falls	Austria	541
Twin	Idaho	180
Velino Falls	Italy	591
Vermafos	Norway	984
Vettisfos	Norway	950
Victoria Falls	Zambezi	400
Voringsfos	Norway	600
Yellowstone (upper)	Montana	110
Yellowstone (lower)	Montana	310
Yguazu or Iguazu	Brazil	210
Yosemite (upper)	California	1,436
Yosemite (middle)	California	626
Yosemite (lower)	California	400

Niagara in winter presents a picture of frozen grandeur equaled nowhere else in the world.



The Rhine at Schaffhausen, Switzerland, rushes over rugged rocks on its way down from the highlands into the lovely and historic valley it has carved for itself on its way to the sea.



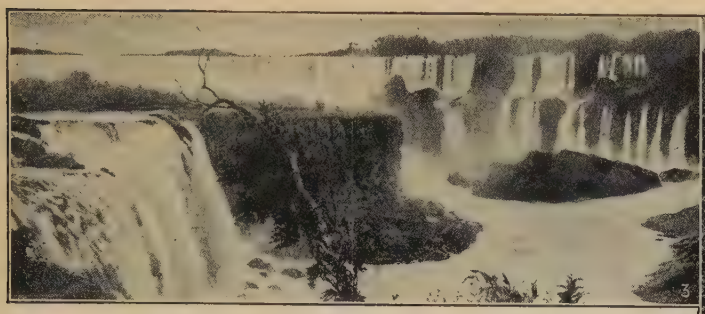


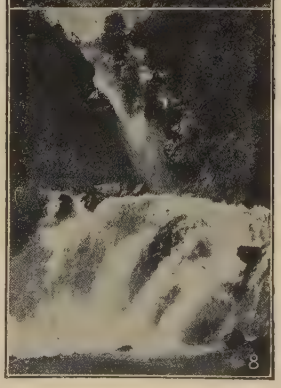
FAR-FAMED WATERFALLS THAT HAVE

1. The Niagara Falls and rapids form one of the most impressive spectacles in the world. The Niagara River, which is the sole outlet of the great lakes, pours itself in two vast sheets over a precipice about 160 feet high. Goat Island, which is situated on the lip of the falls, divides the cataract into two sections—the Horseshoe, or Canadian fall, which is by far the more majestic, and the America fall. It has a descent of 158 feet and the American fall of 167 feet. The volume of water which sweeps over this immense chasm is about 15,000,000 cubic feet per minute. The limestone edge of both falls is wearing away in the center, the Canadian fall now being V-shaped, and the American fall showing the same tendency, although its process of recession has begun more recently. For some distance below the falls there is smooth current, the mass of water which pours over the precipice sinking and only coming to the surface two miles below, where the rapids, more magnificent and wilder than those above the falls, begin, and culminate in the rapids of the Upper Whirlpool. Lower down the river is the whirlpool itself, where a sharp turn sends the waters hurling against the Canadian side; they then sweep round in a gigantic circle before they find a vent at right angle with their former course. The sight of the falls is equally awe-inspiring from the bridge on the lip of the fall, from the boat which plies from shore to shore below the cataract, or from the Cave of the Winds, reached from Goat Island. Although in summer the magnificence of the sight is extraordinary, it is in winter, when the wizardry of the frost is upon it, that it is superlatively beautiful. The falls were first discovered by Father Hennepin in 1678.

2. The Falls of Juanacatlan (*hoo-ă-nă-kwt-lăn*), Mexico, are located near the island city of Guadalajara (*guă-dă-lă-hă'ră*) on the Rio Grande de Santiago. Though only 70 feet in height they are more than 600 feet wide, and as known as the "Niagara" of Mexico.

3. The Cataracts of Iguazu (*e-gwă'soo*) on the frontiers of Brazil, Argentina and Paraguay. These falls, situated in a remote wilderness, far from civilization, are a veritable fortress in protecting the peace-loving peoples on their borders. They constitute a series of falls extending over three miles, and more than 200 feet in height, and of magnificent scenic beauty. Their energy is estimated





INSPIRED TRAVELERS AND WRITERS

to be about 14,000,000 horse-power, or almost three times that of Niagara.

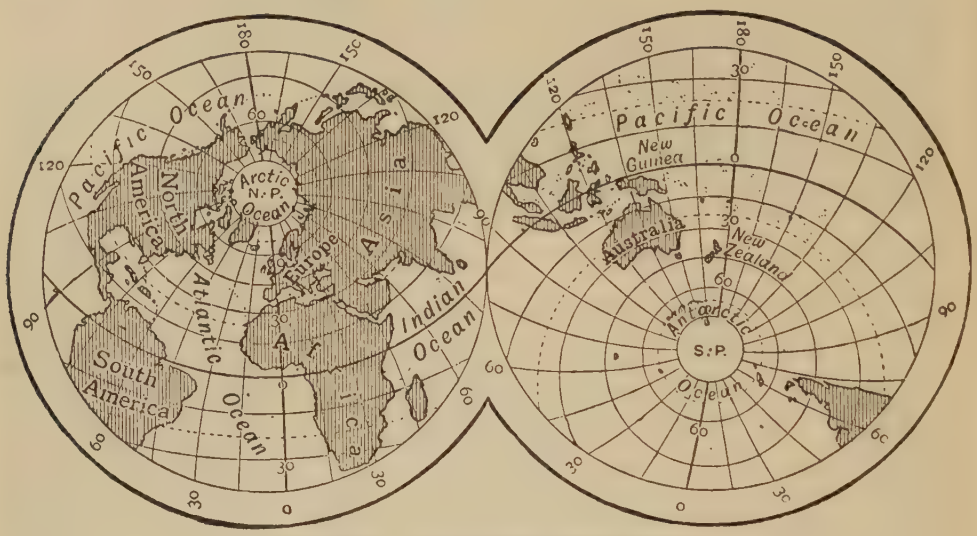
4. The Yosemite (*yo-sem'i-tee*) Falls of California, are highest and probably the most remarkable of their class. They descend an almost perpendicular ledge of rocks 2,600 feet high to the bottom of the Yosemite valley, forming three separate cataracts. The first fall is 1,600 feet sheer descent. Then comes a series of cascades, partly hidden, 600 feet downward, and a final leap of 400 feet. Seen from afar, the Yosemite Falls seem insignificant; but they are, in fact, 35 feet wide, and the shock of their descent is observed a mile away.

5. The Staubbach (*stoub'băk*) Falls, in the Swiss Alps near Lauterbrunnen, descends a precipice of 980 feet, and is reduced to spray like a misty veil before reaching the bottom. It is the highest unbroken fall in Switzerland, and the most noted.

6. The Great Falls of the Yellowstone, though not so high, vie with the Yosemite in striking beauty. These famous falls plunge from a height of 360 feet into the abyss of a mighty chasm. At the point of descent, the waters of the Yellowstone suddenly contract from a width of 250 feet to 75 feet.

7. The Bridal Veil Falls of California, belong to the famous Yosemite Valley. Its waters, over 30 feet wide, leap from the granite rocks on the south wall of the Yosemite in two vertical descents aggregating over 900 feet. The first fall covers a distance of 600 feet, then the waters rushing over a sloping pile of jagged rocks drops a perpendicular distance of 300 feet more. From the chief points of view it seems to make but one plunge, in an unbroken descent similar to the Staubbach, but carrying a much greater volume of water. Frequently the wind swings the great plume of water from the face of the cliff and waves it like a scarf or veil. At sunset rainbows with an indescribable radiance bejewel its foam and the glistening leaves surrounding it.

8. The Reichenbach (*ri'ken-băk*) Falls near Meiningen, Switzerland, comprise five fine cascades in the Reichenbach River. The most gorgeous of these, known as the Upper Fall, makes a huge leap of 300 feet into a deep rocky basin, which then continues in several foaming and plunging cascades in general aspect not unlike the Niagara gorge.



THE LAND AND WATER HEMISPHERES

The Oceans consist of one great fluid mass, and in extent covers three times the area of the dry land. There is also about three times as much land to the north of the equator as there is to the south of it. Though the waters of the ocean surround the land on every side, yet they are broken up into certain areas by the arrangement of the land portions, and to these various parts we give particular names.

The Atlantic Ocean, lying between the western shores of Europe and Africa and the east coast of America.

The Pacific Ocean, lying between the west coast of America and the east coast of Asia.

The Indian Ocean, lying between the south of Asia and the Antarctic circle.

The Arctic Ocean, lying within the Arctic circle.

The Antarctic Ocean, lying within the Antarctic circle.

VAST EXTENT OF THE OCEANS

THE ATLANTIC is the most branching of the oceans, and is especially distinguished by the number and great size of its inland seas. Two of these, the Mediterranean Sea and the Gulf of Mexico, lie in the warm regions; and two, Hudson Bay and the Baltic Sea, in colder latitudes.

The broader seas are represented by the Caribbean Sea, within the tropics and the Gulf of St. Lawrence and the North Sea in temperate latitudes. The Gulf of Guinea, and the Bay of Biscay, are examples of the more shallow coast waters.

THE PACIFIC is particularly rich in vast border seas, a continuous series of which lines the Asiatic and Australian coasts. Among these are the Behring Sea, enclosed by the peninsula of Alaska and the Aleutian Islands; Okhotsk Sea, enclosed by Kamchatka and the Kurile Islands; the Sea of Japan, and the North and South China seas; and the Arafura, Coral, and New Zealand seas, on the Australian Coast.

Only two inland seas of considerable size—the Gulf of California in North America, and the Yellow Sea in Asia—mark this entire basin.

THE INDIAN OCEAN is characterized by gulfs, two of which form the entire extension of the basin; namely, the Gulf of Bengal, and the Arabian Sea. It has also two inland seas of considerable extent, the Red Sea and the Persian Gulf, isolating the peninsula of Arabia from the adjacent continents; but border seas are wholly wanting in the Indian Ocean.

THE ARCTIC OCEAN is a partially enclosed sea, which a comparatively inconsiderable rise of the sea-bottom would convert into a true mediterranean. Three openings connect it with the

Pacific and Atlantic Oceans, namely, Behring Straight (narrow and shallow), Davis Straight, and the broad expanse of water lying between Norway and Greenland. Of these, the last is by far the most important, for through it the warm waters of the Gulf Stream find access to the Polar basin, and keep the sea free from ice throughout the year. This current is supposed to flow feebly along the coast of Siberia, until, deflected by the land, it becomes merged in the cold counter-currents which, passing along the eastern coasts of Greenland and Labrador, carry immense masses of ice into the Atlantic.

THE ANTARCTIC OCEAN is situated about or within the antarctic circle. The great Southern Ocean is that part of the ocean which surrounds the world between the latitude of 40 degrees south and the antarctic circle. The northern portions of this band are often called the South Atlantic, South Indian and South Pacific, while the southern portions are usually called the Antarctic Ocean. The average depth of the continuous ocean which surrounds south polar land is about two miles; it gradually shoals toward antarctic land, which in some places is met with a short distance within the antarctic circle. Life is abundant in the surface waters, and at the bottom of the ocean.

HOW THE FLOOR OF THE OCEAN APPEARS

As a rule the sea is shallowest near the land, though in a few cases there is a sudden descent to a great depth at a very short distance from the coast. Lowlands have usually shallow seas near the coast, and highlands deep water.

Along the American shores, in the latitude of New York, the depth, for a distance of more than 100 miles, is less than 600 feet; then suddenly the bed descends, by a steep slope, to the depth of 6,000 or 9,000 feet. After a comparatively narrow internal, a second terrace descends to the main basin, from 15,000 to 18,000 feet deep.

The bottom of the trough of the ocean, in general, is equally varied with that of the land surface of the globe, forming mountains, hills, valleys, tablelands, etc. In many parts these marine mountains reach above the surface and form islands. On the table land extending across the Atlantic between Newfoundland and Ireland is laid the submarine-telegraph cable which connects the two hemispheres.

THE DEPTH OF THE OCEANS. The average depth of the Pacific Ocean has been estimated at between 15,000 and 18,000 feet, which is slightly greater than that of the Atlantic. The deeper portions may be learned on reference to the map. The western portion of the North Pacific in particular shows some very deep depressions. To the east of Japan lies a long deep trough which in one part has furnished the sounding of nearly five and one-half miles. This abyss is often called the Tuscarora Deep. South of the Ladrone Islands, in the Caroline Archipelago, there is also a deep abyss where an English ship, the *Challenger*, obtained a sounding of nearly 27,000 feet. In the Pacific soundings of over 30,000 feet have been made.

The Indian Ocean has an average depth of about 12,000 feet, and the deepest soundings have been taken on the eastern side. It is interesting to observe that the deepest sounding, about five and three-quarter miles, in the South Pacific somewhat exceeds the height of the highest mountain. Mount Everest has a height of 29,000 feet above the sea level. And it must also be noted that the mean height of the land, 1,000 feet, is only about one-twelfth the mean depth of the whole ocean, 12,000 feet. (See colored map showing comparative surfaces of land areas and ocean depths.)

INLAND AND BORDER WATERS. These enclosed basins belong to the structure of the continents, rather than to the oceans. All are shallow in comparison with the great basins with which they are connected, as is apparent from the depths given below.

The Gulf of Mexico is from 5,000 to 7,000 feet in depth. The deepest part of the Caribbean Sea, on a line connecting Porto Rico and Costa Rica, averages 7,000 feet, and near the latter it reaches a depth of 14,000; but the ocean, immediately outside of the Lesser Antilles, is more than 18,000 feet deep.

The Mediterranean is divided into two basins, by a rocky isthmus, from 50 to 500 feet below the surface, lying between Sicily and Cape Bon, in Africa. The western basin is over 9,000 feet in depth, and comparatively uniform; while the eastern is more irregular, varying from 6,000 near the center, to 13,000 feet, south of the Ionian Islands. The Red Sea has an irregular bottom.

with an average depth of 3,000 feet, but in some places it reaches 6,000.

The Baltic Sea, being a simple depression in the great European plain, is but a few hundred feet deep. In the North Sea, the depth averages 300 feet, and rarely exceeds 600. The continent is here prolonged in the form of a submarine plain, whose highest portions form the British Isles.

The Border Seas of Asia, lying within the chain of continental islands, are only a few hundred feet in depth, while immediately without those islands, abrupt slopes descend to the great depths of the Pacific basin.

Smaller inlets are also of frequent occurrence, especially in districts where mountain ranges approach the borders of the ocean. Such are the *lochs* of Scotland, the *voes* of the Shetland Islands. and the *fiords* of Norway and Greenland. The term *lagoon* is usually applied to lake-like inlets.

Salt and Other Ingredients of Sea-water. The waters of the ocean are salt, holding in solution various saline matters. The saline ingredients amount to rather more than thirty-five grains in a thousand grains of sea-water. The most abundant of these is chloride of sodium or common salt, which in general forms about a third of the whole. Besides this, sea-water contains some magnesia, lime, potash, and traces of iodine and bromine.

The following table exhibits the exact percentage composition of sea-water.

One hundred parts by weight of sea-water contain:

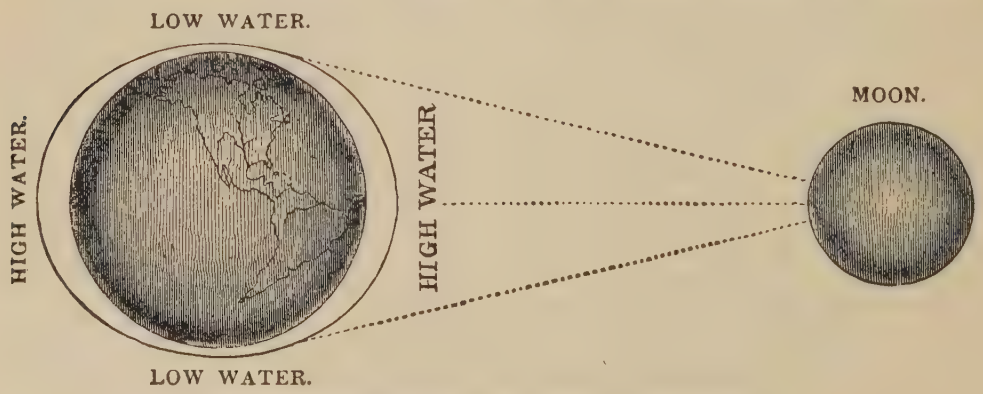
Water	96.470
Sodium Chloride	2.700
Magnesium Chloride	.360
Potassium Chloride	.070
Magnesium Sulphate	.230
Calcium Sulphate	.140
Calcium Carbonate	.003
Magnesium Bromide	.002
Traces of Iodides, Silica, etc., estimated	.025
	100.000

How the Sea gets its Color. The color of sea-water is due to the character of the skies and clouds above, and to vegetable and animal objects growing and living in it. The luminosity or phosphorescence of the ocean is due to the decay of animal and vegetable substances, but in some cases it arises from the presence of myriads of living animals, which, like the glow-worm and fire-fly of the land and air, have the power of emitting light.

Ocean Temperature. The water of the ocean appears generally to agree with that of the climate in which it is situated. In warm latitudes the temperature of the deep sea diminishes with the depth below the surface until a certain depth is reached, below which it appears to retain an equable temperature, this being about 40 degrees Fahrenheit. In the Polar Seas, where the temperature of the surface is lower than 40 degrees the heat increases downward until it reaches that point. In latitude 70° the temperature of the ocean is considered to be the same at all depths.

Cause of the Tides, Waves and Currents of the Oceans

The waters of the ocean are retained in their bed by the attraction of gravitation. This power is great in proportion to the mass; and as the earth is of much greater mass than the particles of water on its surface, it attracts them and keeps them in their assigned places. But the sun and moon also possess this power of attraction, and notwithstanding their distance, attract and draw them



HOW TIDES ARE FORMED BY ACTION OF THE MOON

The moon pulls the waters of the earth into a great double wave heaping it up on the side nearest to the moon and on the opposite side. As the earth rotates, this double wave moves round the earth, and the crests and troughs alternately produce high and low tide. Thus there are two high and two low tides daily, at intervals of about twelve hours or half a Sun or day.

VAST OCEAN CAVERN AT CAPRI, WIDELY KNOWN AS THE "BLUE GROTTO"

This remarkable cavern, on the shore of the island of Capri, at the entrance of the Bay of Naples, is entered from the sea, and is one hundred and eighteen feet long and forty feet high, with a breadth of ninety-eight feet at its widest part. If derives its name from the wonderful blue reflection of the sun's rays through the water, which gives the interior its marvelous beauty and majesty. The cavern has been created by the ceaseless action of the tide.

up to a certain elevation. The vast mass of the waters being drawn up by the moon into a mountain or curve of water forms what is called the "great primary or tidal wave."

Ebb-tide and Flood-tide. This drawing up of the waters of mid-ocean causes a recession from the shores, thus giving rise to ebb-tide, or low water. But when the temporary attraction ceases the waters flow back to their natural level, returning to shore and forming flood-tide, or high water. This culmination or rising of the waters in the great tidal wave takes place twice in twenty-four hours and fifty minutes. The combined influence of the sun and moon at new and full moon augments the size of this wave, and causes the "spring-tides" at those periods.

Height of Tides. High water at the various points along the coast is dependent on the return of this great wave, though some variations are caused by local peculiarities; and the height of the tide also varies greatly in different parts of the earth.

On the eastern coast of North America, the average rise of the tide is from nine to twelve feet. At the entrance to the Bay of Fundy, however, it rises eighteen feet, while at the head of that bay it reaches sixty, and in the highest spring tides, even seventy feet. At Bristol, in England, the spring tides rise to forty feet; and at St. Malo, on the south coast of the English Channel, they reach fifty feet.

The Maelstrom, Charybdis and Hell Gate

Differences in level, produced by high tides, cause currents which vary in force and direction with the condition of the tide, producing, in some cases, dangerous whirlpools. The famous Maelstrom, off the coast of Norway, is but a tidal current, which rushes with great violence between two of the Lofoden Islands, causing a whirling motion in the water which is reversed at each ebb and flow of the tide.

Such is, also, the famous whirlpool of Charybdis, in the Straight of Messina, and many others of less note. The powerful currents of Hell Gate, in the

passage from Long Island Sound to New York Bay, are due to a similar cause, high water occurring at different hours in the bay and in the west end of the sound.

WHAT CAUSES THE WAVES OF THE OCEAN

The waves of the ocean, which are caused by the action of the wind, and which are called secondary or wind waves are of a totally different character from the tidal wave. The influence of the wind is supposed not to extend to a greater depth than forty or fifty feet, the deep sea, though raised in a great mass by the grand tidal movement, being free from agitation. Wind waves at a distance from the shore are comparatively low and long, but in shoal water they assume a greater curvature, and fall on the beach either in gentle ripples or in mighty breakers, according to the depth of the water and the force of the wind. The heavy swell which occasionally takes place, called the "ground sea," is supposed to originate in distant storms of wind.

THE RIVERS IN THE SEA

Currents in the ocean arise from various causes. They may be produced by long-continued gales of wind, by the melting of polar ice, or by any cause that may give rise to onward movements of limited portions of the great mass of waters. Other currents, and of these only is it necessary to speak in this connection, are permanent. The most remarkable of these are the polar currents and the equatorial currents.

Polar Currents are produced by the perpetual movement of the waters from the poles to the equator. In accordance with the laws of mechanics, an accumulation of the waters takes place on that part of the globe which has the greatest velocity of motion; and as the earth in turning on its axis moves with far greater velocity at the equator, the waters continually flow toward that line from the poles.

Equatorial Currents. This accumulation of the waters at the equator tends to produce the equatorial currents, which consist of the continuous progression of the tropical seas in a westerly direction. When the wave brought by the polar currents arrives—coming as it does from regions where it naturally has less velocity—it does not at once acquire the velocity of the earth's motion at the equator; and since the rotation of the earth is from west to east, this portion of the water lagging behind forms a stream or current which has an apparent motion from east to west, that is to say, apparent as regards the earth, but real in relation to the adjacent land and water. The trade winds, which in this zone blow constantly in the same direction, lend their aid in maintaining the equatorial current.

THE GREAT SYSTEMS OF OCEAN CURRENTS

An extensive system of currents appears to arise in the Antarctic Ocean. A current of cold water flowing northward joins the equatorial current in the Pacific. Entering the Indian Ocean, it maintains its westerly course until it approaches the shores of Africa; then bending southward it rushes through the Mozambique Channel, and doubling the Cape of Good Hope travels northward until it arrives at the Bight of Benin. This current then joins the equatorial current, and crossing the Atlantic from the coast of Guinea to that of Brazil, it is divided into two branches by the projecting headland of Cape San Roque, one flowing southward and the other northward.

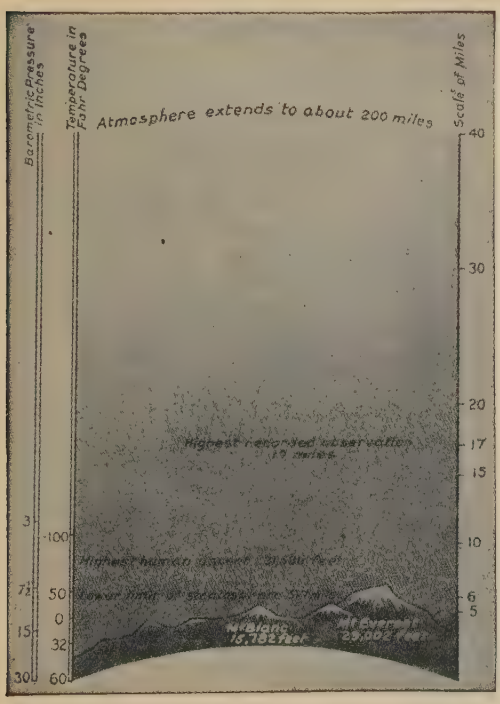
The Gulf Stream. After passing the Island of Trinidad, this great oceanic current enters the Gulf of Mexico, and there acquires a high temperature, and sweeping round that sea it again pours forth into the Atlantic, forming the most powerful of known currents, called the Gulf Stream. Issuing from the Gulf of Mexico, this current of warm water rushes with considerable force through the Bahama Channel; then taking a northerly course it parallels the eastern shores of North America, and at Newfoundland is turned to the eastward by an opposing cold current which sets in from Baffin's Bay. It now maintains an easterly direction, and crossing the Atlantic arrives at the Azores in about twenty-eight days, and divides its waters on the coast of France and Spain: one portion goes southward and at length joins the grand current which sets from the coast of Guinea; and another portion travels northward and skirts the western coasts of Europe. These currents are seldom more than 500 feet deep.

ATMOSPHERE, CLIMATE AND WEATHER

THE atmosphere is the vast ocean of air that envelops the earth and makes life possible on our globe. It absorbs the heat and vapors caused by the action of the sun upon the surface of both land and water, and is the medium through which the ever-changing phenomena of *climate* and *weather* are produced. The two great forces of nature acting in connection with it are *gravitation* and *heat,* or solar radiation; and the results of their ceaseless action may be summed up as follows: (1) *Temperature,* or heat, which we soon learn to know by our senses, and to measure by the thermometer. (2) *Evaporation,* which changes the weight of the air by carrying invisible moisture through it. This change of *weight* is indicated by the barometer. (3) *Condensation,* producing fog, dew, rain, hail, and snow; all estimated accurately by the rain gauge or pluviometer. (4) *Motions,* as in the winds, varying from the gentle breeze to the awful cyclone, the force and velocity of which are indicated by the anemometer. (5) *Electricity,* producing lightning, thunder, magnetic and chemical changes in the atmosphere. (6) *Optical Phenomena,* such as rainbows, haloes, coronas, mirage, and the auroras.

THE ATMOSPHERE: ITS EXTENT, CHARACTER, USE AND EFFECT

THE EARTH is enveloped in its own atmosphere, which like a transparent covering surrounds it, and revolves with it. This atmosphere does not extend to more than two hundred miles above the earth's surface, and is higher at the equator than at the poles.



WHAT THE ATMOSPHERE IS COMPOSED OF

The atmosphere is an elastic fluid consisting of a mixture (not a compound) of oxygen and nitrogen, in the proportions of about twenty-one of the first to seventy-nine parts of the last named. It also contains a small quantity of carbonic acid gas, and a yet smaller quantity of ammonia; and water in the form of invisible vapor is always present in it, though the quantity is subject to great variations. All these substances move freely among each other, and are continually changing places: the oxygen being ever ready to perform the office assigned to it of sustaining life and combustion; the carbonic acid to promote the growth of vegetation; the nitrogen to perfect the fruits of the earth, and the vapor to descend to the thirsty ground, in the form of showers and dew.

The atmosphere is elastic, and therefore capable of expansion and compression; and is also a ponderable body. The consequence of these properties is, that it is much lighter and thinner in the upper regions than nearer the earth's surface; for at the sea-level its whole weight presses on its lower strata and gives it greater density. Ascending from the earth's surface it becomes gradually lighter and thinner, and at great elevations is so rarefied as to be unsusceptible of sustaining life.

HOW THE ATMOSPHERE IS WEIGHED AND MEASURED

The weight of the atmosphere at the level of the sea is equal to about fourteen and one-half pounds on every square inch of surface. This weight is balanced by a column of mercury thirty inches in height; but at an elevation of 18,000 feet it would be balanced by a column of only fifteen inches in height, and at 36,000 by one only seven and one-half

inches in height. It is on this principle that the mercurial barometer has been constructed; and since the mercury in the barometer stands at the same point at all places at the sea-level, and falls in a regular ratio on ascending therefrom, this instrument forms a most useful standard for measuring altitudes.

As we ascend from the sea the atmosphere becomes colder; but, as with the density, the temperature does not appear to pass through regular gradations of change. From experiment, however, it has been assumed that the atmosphere loses one degree of heat by Fahrenheit's thermometer for every 350 feet of ascent; and hence even in the hotter regions very lofty mountains are covered with perpetual ice and snow.

DISTRIBUTION OF TEMPERATURE OVER THE EARTH

The amount of heat produced by the sun upon the Earth's surface, is greatest near the Equator, and diminishes gradually towards the Poles. Three general causes, each referable to the spherical form of the Earth, combine to produce the gradual diminution of temperature from the Equator to the Poles.

1. The angle at which the Sun's rays strike the surface. In the Equatorial regions they are perpendicular to the surface of the sphere, and there produce their maximum effect; but, on account of the curved outline of the globe, they fall more and more obliquely with increasing latitude, and the intensity of action diminishes proportionately. At the Poles their effect is practically nothing.

2. The area on which a given amount of heating power is expended, is least at the Equator, consequently the resulting heat is greatest. The area covered increases, and the effect diminishes, with the increasing obliquity of the Sun's rays in higher latitudes, which, as we have seen above, results from the spherical form of the Earth.

3. The absorption of heat by the atmosphere, as the Sun's rays pass through it, is least where they fall perpendicularly,—that is, in the Equatorial regions,—and increases, with their increasing obliquity, towards the Poles.

EFFECT OF THE MOTIONS OF THE EARTH

The Earth revolves constantly around the Sun, and at the same time rotates upon an axis inclined twenty-three and one-half degrees towards the plane of its orbit. In consequence of the inclination of the axis, the declination of the Sun, or its angular distance from the Equator, varies with the advance of the Earth in its orbit, causing periodical variations in the length of day and night, and, consequently, in temperature.

VERNAL EQUINOX. On the twentieth of March, at mid-day, the Sun is vertical at the Equator. Rising directly in the east it ascends the heavens to the zenith, and, descending, sets directly in the west.

The illuminated hemisphere extends from pole to pole, and embraces half of every parallel of latitude; hence every point on the Earth's surface is under the rays of the Sun during half of the diurnal rotation; the days and nights are equal all over the globe; and the heating power of the Sun is the same in both the northern and the southern hemisphere.

SUMMER SOLSTICE. As the Earth advances in its orbit the vertical Sun declines northward; and on the twenty-first of June, at the Summer Solstice, it is over the northern Tropic, twenty-three and one-half degrees from the Equator.

The illuminated hemisphere, extending ninety degrees on each side of the parallel of the vertical Sun, reaches twenty-three and one-half degrees beyond the North Pole; but, at the south, it barely touches the Antarctic circle. It embraces more than half of each parallel north of the Equator, hence throughout the northern hemisphere the day is longer than the night, the difference in their duration increasing with the latitude; and all points within the Arctic circle are in the light during the entire rotation.

In the southern hemisphere, less than half of each parallel being illuminated, the night is longer than the day, and within the Antarctic circle there is constant night. The heating power of the Sun is now at the maximum in the northern hermisphere, while in the southern it is at the minimum.

AUTUMNAL EQUINOX. On the twenty-second of September, the distribution of light and heat upon the two hemispheres is the same as at the Vernal, and at the *Winter Solstice*, on the twenty-second of December, it is the reverse of that at the Summer Solstice.

WHAT CAUSES THE SEASONS AND DAY AND NIGHT

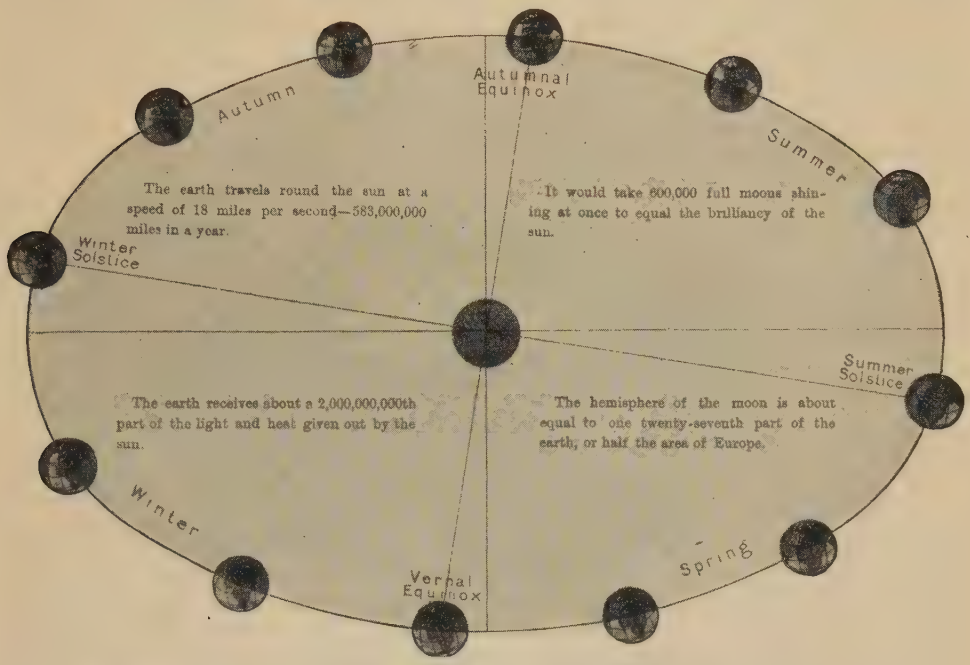


FIGURE ILLUSTRATING THE CHANGE OF SEASONS THROUGHOUT THE YEAR

The change of seasons is caused by the *revolution* of the earth around the sun, and the inclinations of the planes of the equator and ecliptic. These causes also account for the difference in the length of the days and nights and the difference in the height of the midday sun. The exact duration of the seasons we get by observing the dates of equinoxes and solstices.

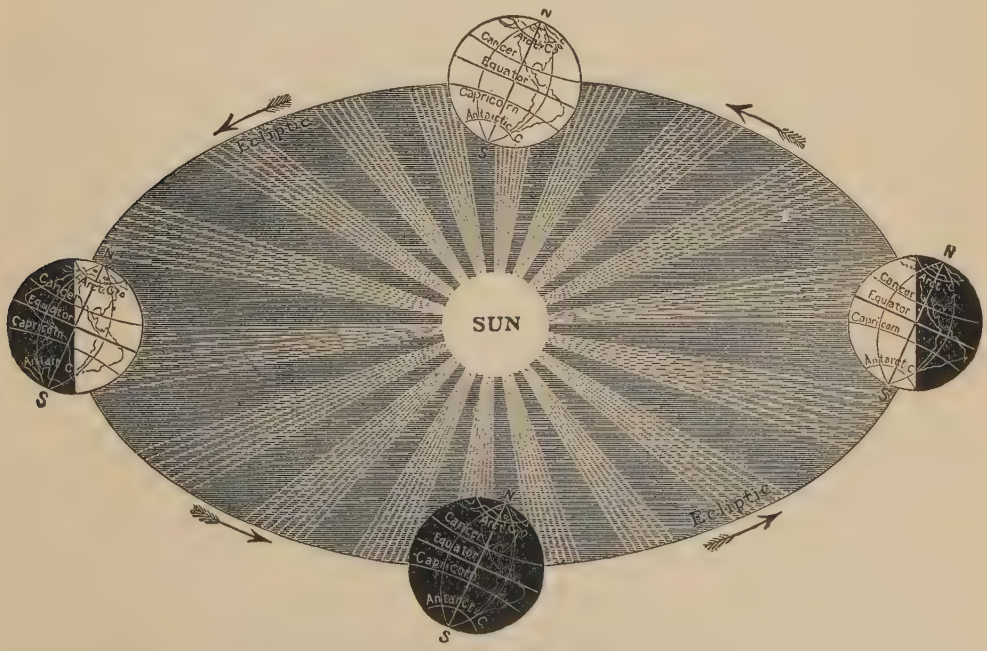


FIGURE SHOWING THE CAUSE OF DAY AND NIGHT

The *revolution* of the earth gives us the length of the year; its *rotation* on its axis, the length of the day and night, by causing the risings and settings and daily apparent motion of the sun and stars.

EFFECT OF UNEQUAL DAYS AND NIGHTS ON TEMPERATURE

The inequality in the length of the days in different parts of the year, occasioned by the inclination of the Earth's axis, is of itself sufficient to produce a marked variation in temperature.

During the day the Earth receives from the Sun more heat than it radiates into space; while during the night it radiates more than it receives. Hence a succession of long days and short nights results in an accumulation of heat, raising the average temperature and producing summer; while long nights and short days result in a temperature below the average, producing winter.

Again, the heating power of the Sun in each hemisphere is greatest at the period of the longest days, because of its greater altitude in the heavens; and least at the period of shortest days. Thus long days and a high sun operate together to produce the high temperature of summer; while long nights and a low sun cause the low temperature of winter.

The following table gives the length of the longest day, excluding the time of twilight, and of the shortest night, in the different latitudes, with the difference of duration in hours and minutes, thus exhibiting more clearly the above law.

TABLE OF UNEQUAL DAYS AND NIGHTS

LATITUDE	Longest Day	Shortest Night	Difference
Equator	12.0 hours	12.0 hours	00.0 hours
10°	12.7 "	11.3 "	1.4 "
20°	13.3 "	10.7 "	2.6 "
Tropics	13.5 "	10.5 "	3.0 "
30°	14.0 "	10.0 "	4.0 "
35°	14.5 "	9.5 "	5.0 "
40°	15.0 "	9.0 "	6.0 "
45°	15.6 "	8.4 "	7.2 "
50°	16.3 "	7.7 "	8.6 "
55°	17.3 "	6.7 "	10.6 "
60°	18.7 "	5.2 "	13.4 "
Polar Circles	24.0 "	0.0 "	24.0 "
67 ½°	1 month	0.0 "	.....
69 ½°	2 months	0.0 "	.....
73.3°	3 "	0.0 "	.....
78.3°	4 "	0.0 "	.....
84°	5 "	0.0 "	.....
North Pole	6 "	0.0 "	.....

LAW OF VARIATION OF DAY AND NIGHT

The inequality of day and night increases slowly in the tropical regions, but more and more rapidly towards the polar circles. Beyond these circles the Sun, in the hemisphere in which it is vertical, makes the entire circuit of the heavens, without sinking below the horizon, for a period varying from twenty-four hours to six months; while in the opposite hemisphere there is a corresponding period of continuous night.

RESULT OF THIS LAW IN DIFFERENT ZONES

In the tropical regions, where the days and nights vary little in length, the temperature is nearly uniform throughout the year; while the increasing inequality of day and night towards the Poles, causes an increasing difference between the summer and the winter temperature.

Again, the length of the day, in the summer of high latitudes, compensates for the diminished intensity of the Sun's influence; so that the temperature, in the hottest part of the day, may equal, or even exceed, that within the tropics. A summer day in Labrador or Petrograd may be as warm as one under the Equator; but in the former latitudes there are only a few days of extreme heat in the year, while with increasing nearness to the Equator the number of warm days constantly increases.

HOW THE SEASONS VARY IN DIFFERENT LATITUDES

The high latitudes have short, hot summers, and long, severe winters. The transition seasons, spring and autumn, on account of the very rapid change in the length of the days, are short and scarcely perceptible.

In the middle latitudes the summer and winter are more nearly equal in length, with less difference in the extreme temperatures; and the transition seasons are distinctly marked. Farther towards the Equator the summer increases in length, and the winter diminishes, while the tropical latitudes have constant summer.

WINDS AND OTHER AIR CURRENTS

The winds appear to be caused by partial changes in the density of the atmosphere in a great measure arising from a diverse distribution of heat. When air is warmed it becomes less dense, or, in other words, it occupies a greater space. If an adjacent stratum of air be cooler, it will on coming in

contact with the warmer air expand and pour into space occupied by the latter, thus forming a current. The greater the difference between the temperature of the one or other portion, the greater will be the force which the cold portion will rush into the space occupied by the warm portion, or, in other terms, the more violent will be the wind. In temperate climates the winds are variable; but in some parts of the world they blow with great regularity, and in others are subject to periodical changes.

WHAT CAUSES THE TRADE-WINDS

The most remarkable of the regular winds are the trade-winds. The atmosphere at the surface between the tropics is much warmer than in the higher latitudes; and since air expands when heated, the light warm air of intertropical regions perpetually rises, and its place is as perpetually supplied by the colder air from the north and the south. If it were not for the Earth's rotation, these would be merely north and south winds; but like the equinoctial water-currents, these cool currents of air coming from regions which have not an equal velocity of rotation with the air at the equator, pause and hang back, and thus these aerial currents acquire a westerly direction, forming north-easterly constant winds in the northern hemisphere, and south-easterly in the southern hemisphere.

MONSOONS AND THEIR LOCATION

The monsoons or periodical winds of the Indian Ocean owe their origin to the same cause which gives rise to the trade-winds, though they acquire a different character in consequence of the proximity of the land. In the southern portions of the ocean which are remote from this cause of disturbance, the trade-wind blows with its wonted regularity; but in the seas occupying the region between the eastern coast of Africa on the one side, and the Malay peninsula and the island of Sumatra on the other, the course of the trade-wind is reversed for half the year. This change occurs from April to October; the sun at that period being vertical north of the equator, and the land in the adjacent regions acquiring in consequence a high temperature, and the air over the sea being cooler than that over the land, a south-west wind prevails. This wind, called the "south-west monsoon," commences at about three degrees south of the equator, and passing over the ocean arrives charged with moisture, and accordingly usually deposits copious supplies of rain in India and some of the adjoining territories. In the remaining half of the year, or from October to April, the wind assumes the ordinary north-easterly direction of the trade-wind.

Sea-breezes, which occur in regions bordering on the ocean in hot climates, are produced by causes similar to those which give rise to the south-west monsoon, but on a more limited scale of action, and changing their direction daily.

THE WHIRL OF THE HURRICANE

Hurricanes are storms of wind which sweep or whirl round a regular course, and are at the same time carried onward along the surface of the Earth. In the northern hemisphere the whirling motion follows the course of east, north, west, and south to east again, and in the southern hemisphere it takes the opposite course. In the Atlantic Ocean, the principal region of hurricanes lies to the eastward of the West India Islands. They are also frequent in the Indian Ocean, at no great distance from the island of Madagascar. The "typhoons" of the China seas, and the "ox-eye" of the Cape of Good Hope, are also revolving storms.

TORNADOES AND OTHER CHARACTERISTIC STORMS

The tornadoes of the western coast of Africa, the pamperos of South America, and the northers of North America appear to be of a different character, and not to possess a revolving motion. The sirocco of Italy and Sicily, and the solano of Spain, as also the simoon of Arabia, and the harmattan of western Africa, are all winds which owe their origin to the heated surfaces of Africa and Arabia. The principal difference between these winds appears to be, that the sirocco and the solano acquire some moisture in their passage across the Mediterranean, and therefore do not possess that extreme degree of aridity which forms the distinguishing character of the simoon and the harmattan.

CLOUDS—THEIR FORM AND CLASSIFICATION

Clouds are continually varying in their form and appearance, but may be classed under the four principal heads of the cirrus, the cumulus, the stratus, and the nimbus.

The cirrus is a light, fleecy cloud resembling a lock of hair or a feather.

The cumulus or summer cloud is generally massive and of a round form; sometimes of small size, and sometimes covering nearly the whole sky, and occasionally appearing in the horizon like mountains capped with snow.

The stratus is a horizontal, misty cloud sometimes observed on fine summer evenings comparatively near the ground, and often crossing the middle regions of mountainous or hilly districts.

The nimbus or rain cloud has a uniform gray tint; it is fringed at the edges when these are displayed, but usually covers the whole sky. The region of clouds is a zone extending in the atmosphere from about one to four miles above the Earth. The most elevated clouds, which are light and fleecy, are those comprehended under the name of cirrus, and the lowest are those which are called stratus.

The cirro-cumulus, cirro-stratus, and cumulo-stratus are only modifications and combinations of the above-named principal classes.

FORMS OF ATMOSPERIC VAPOR

Warm air is capable of holding suspended a larger quantity of moisture than cold air, and therefore the amount of vapor present in the atmosphere is subject to great variations.

WHAT CAUSES DEW

These facts also account for the formation of dew, which is caused by the reduction of the temperature and the deposition of the moisture which the warmer atmosphere of the day had held in suspension. Dews will hence be usually most abundant when cool nights succeed warm days, and on a clear night than when the skies are obscured by clouds, because a cloudless sky is usually much colder than a beclouded one. It is also essential for the copious formation of dew, that the ground or other substance on which it is deposited should be much cooler than the superincumbent air; for if the ground be warm it will impart its temperature to the air near its surface and dew will not be formed.

FORMATION OF MISTS AND FOGS

When the ground or water is warmer than the air, mists and fogs are frequently formed; and since water and marshy surfaces cool less rapidly than dry land, mists and fogs are of more common occurrence in low, damp situations than in dry, elevated districts. They are formed by the condensation of the vapor, or, in other terms, its transformation into the minute globules of water, which instead of descending to the earth in the form of dew, remain suspended above the land or the water.

RAIN, HAIL AND SNOW

Clouds are formed by the condensation of vapor at considerable but various elevations in the atmosphere. Vapor is usually invisible, clouds, therefore, are not vapor but water, and consist of a fine watery powder, the size of each particle being exceedingly minute; and consequently they are so light that clouds formed of an accumulation of such particles are readily borne forward by the winds. Clouds are sometimes suddenly formed and as suddenly disappear, probably owing to sudden and partial changes of temperature. When a considerable difference of temperature prevails in the aerial currents which may come in contact with the local atmosphere, a further condensation takes place, and the particles of this fine watery powder unite into drops, and, becoming heavier, fall to the earth in the form of *rain*, *hail* or *snow*.

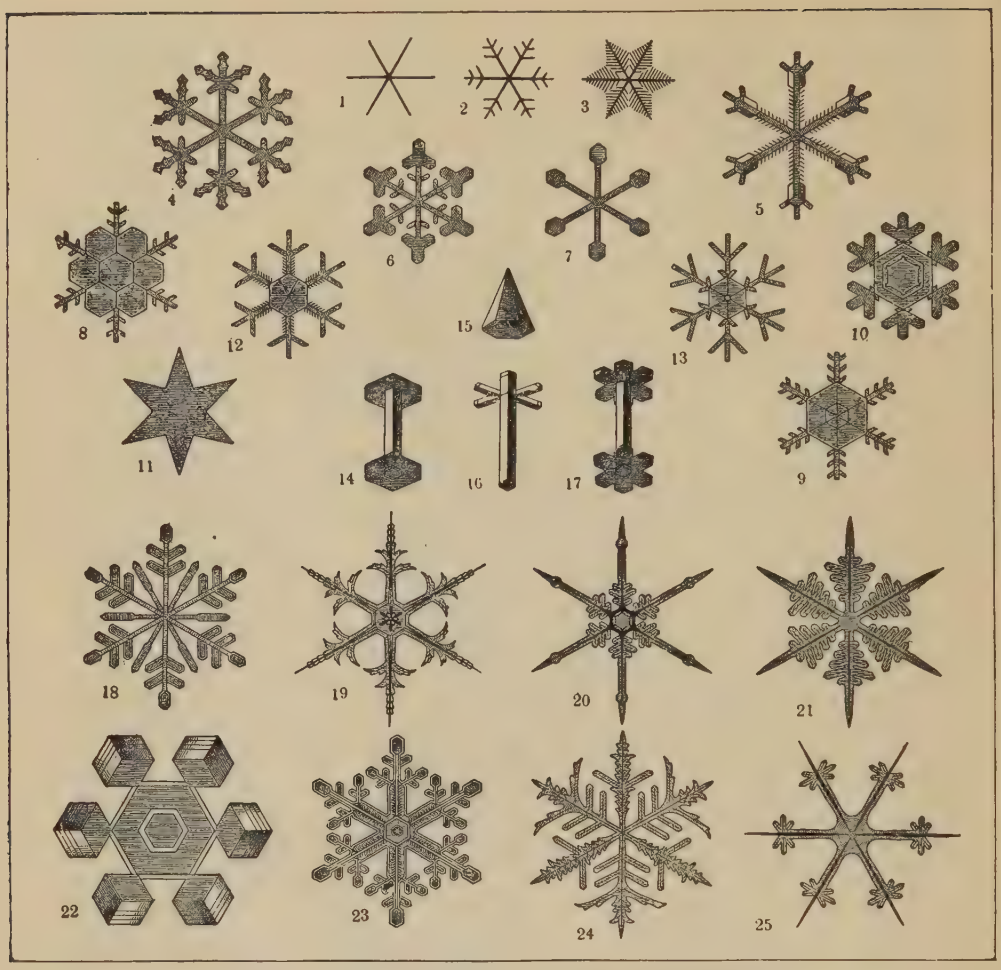
SNOW AND SNOW-CRYSTALS

Vapor condensed in air having a temperature below thirty-two degrees Fahrenheit freezes, or passes to a crystalline form, producing snow. Snowflakes occur in a great variety of forms, which usually present the outline of either a regular hexagon or a six-pointed star.

Their size depends upon the temperature and the relative humidity of the air through which they fall, for, like raindrops, they increase by successive additions from the vapors with which they

PICTORIAL CHART OF THE CLOUDS, SHOWING THEIR FORMS AND POSITION

1. **Cirrus** (*sir'rus*).—Small curl-like clouds, usually high in the heavens. 2. **Cirro-stratus** (*sir-ro-strā'tus*).—Intermediate between the cirrus and stratus. 3. **Cirro-cumulus** (*sir-ro-kū'mu-lŭs*).—Resembling the scales of mackerel. 4. **Alto-cumulus** (*al'tō-kū'mu-lus*).—High cumulus clouds. 5. **Alto-stratus** (*ăltō-strā'tŭs*).—High stratus clouds. 6. **Strato-cumulus** (*strā'to-kū'mu-lŭs*).—Forms of cumulus and stratus combined. 7. **Nimbus** (*nim'bŭs*).—A rain cloud. 8. **Cumulus** (*kū'mū-lus*).—A conical heap of clouds. 9. **Cumulo-stratus** (*kū'mu-lo-strā'tŭs*).—Intermediate between the cumulus and the stratus. 10. **Stratus** (*strā'tŭs*).—Arranged in a horizontal band or layer. 11. **Fracto-stratus** (*frăk'tō-strā'tŭs*).—Broken forms of stratus. 12. **Fracto-Cumulus** (*frăk'to-kū'mu-lus*).—Broken forms of cumulus.



THE BEAUTIFUL CRYSTAL-FORMS OF SNOWFLAKES

1-3. Six-rayed stars. 4-13, 18-25. Combinations of six-rayed stars with decorated flat surfaces. 14, 16, 17 Combinations of stars and columns. 15. A true pyramid.

come in contact in descending. Thus in mild weather they are much larger than in very cold weather.

When the lower air is warm enough partially to melt the crystals, they form minute balls. When raindrops, formed in the upper air, fall through a cold current, they are often frozen, producing *hail* instead of snow.

WHERE PERMANENT SNOW EXISTS

Though the winter snows upon the plains, and the slopes of mountains of medium height, disappear during the warm season; yet, in all latitudes, the tops of high mountains are covered with a layer of permanent snow, which the summer heat of these great altitudes is not sufficient to melt.

The lower limit of perpetual snow, called the snow line, is found, within the tropics, about three miles above the level of the sea. In temperate latitudes it occurs at the height of a little less than two miles; and at the northern limit of the continents, it is about half a mile above the level of the sea, or, perhaps, even less than this.

On the Arctic Islands, vast fields of snow remain permanently, at a few hundred feet above the sea level.

The winter snows, falling into the icy waters of the polar oceans, are but partially dissolved; and, remaining upon

the freezing surface, they help to form those vast ice floes which encumber the polar seas at all times.

The following table gives the observed height of the snow line in the different latitudes:—

HEIGHT OF THE SNOW LINE

Lat. N.	New World	Feet
75°	North Greenland	2,300
54°	Unalaska	3,500
48°	Mt. Baker, Oregon, about	8,000
43°	Rocky Mountains	12,500
39°	Rocky Mountains	14,500
38°	Sierra Nevada	11,000
19°	Popocatepetl, Mexico	14,900
5°	Tolima, Columbia	15,300
Lat. S. 1°	Andes of Ecuador	15,800
17°	Andes of Bolivia, west side	18,500
17°	Andes of Bolivia, east side	15,700
33°	Andes of central Chili	14,700
42°	Andes of Patagonia	6,000
54°	Andes of Straits of Magellan	3,700
75°	Bear Island	600
71°	Mageroe, Cape North	2,300
67°	Sulitelma, Lapland	3,800
61°	Scandinavian Alps	5,300
50°	Altai Mountains	7,000
46°	Alps, north side	8,800
46°	Alps, south side	9,200
43°	Caucasus	11,000
35°	Hindu Kush	13,000
31°	Himalaya, south side	17,400
31°	Himalaya, north side	16,200
12°	Abyssinian Mountains	14,000
Lat. S. 3°	Kilma njaro	16,000
44°	New Zealand Alps	7,500

How snow and ice form glaciers and icebergs

Glaciers (from the French glace, ice) are vast streams of ice which descend from the lower edge of the perpetual snows, like long icicles from a snow-covered roof. They follow the windings of the Alpine valleys, and terminate abruptly in a massive wall of ice, from beneath which the waters of the melting glacier escape, through a large icy vault.

Most famous glacier region

The mountain systems in the middle latitudes, with abundant snows and alternate warm and cold seasons, are most favorable to the formation of glaciers. The best known, and probably the most remarkable glaciers are those of the high Alps, in the heart of which are Mont Blanc, Monte Rosa, and the Bernese Alps. Late explorers have found large glaciers in the Caucasus and in the Himalayas, the last being of the grandest proportions. In the Scandinavia are many which descend, in the deep western fiords, nearly to the sea level.

In the New World glaciers are less frequent. On Mount Shasta and Mount Rainier fine examples are in evidence.

By far the most extensive glaciers however, are found on the snow-covered islands of the polar oceans.

Vast masses of ice, broken from the ends of these glaciers, form the enormous *icebergs* (mountains of ice) which are so numerous in the polar seas, and are transported by the currents even to middle latitudes.

CLIMATE AND WEATHER

The term *climate* is used to express the combination of temperature and moisture which prevails at any particular place, or, in more familiar terms, the prevailing *weather*.

The most prominent causes of diversity of climate are the heat of the sun, the respective position of land and water, and the elevation of land above the level of the sea. To these may be added, as producing considerable though less marked effects, the nature of the soil, the prevailing winds, the position of mountain ranges, and the currents of the ocean.

The supreme influence of the sun

The sun is the grand agent in diffusing heat over the earth's surface. While the sun is above the horizon of any place, that place is receiving heat; and when the sun is below the horizon, it is parting with it by the process called "radiation." Whenever therefore the sun remains more than twelve hours out of the twenty-four above the horizon of any place, and consequently less than twelve hours below, the general temperature of that place will be above average; and when the reverse occurs, it will be below average. If the temperature depended solely on the heat of the sun, then indeed a tolerably accurate view of the respective climates of the zones of the globe might easily be assumed; but it is so greatly modified by other circumstances, that considerable differences prevail in countries situated in the same parallels of latitude.

How affected by position of land and water

The relative position of the land and water is an essential cause of this diversity. The waters of the ocean are of

THE LIFE-GIVING SUN SENDING HEAT AND LIGHT

The sun is the great life-giver of our earth. Its waves of light and heat and electricity come to the earth through a measureless ocean of ether and make it a living rather than a dead world. The above illustration shows how these waves are constantly bombarding the earth, and not only giving it life but contributing to it the glory of the seasons, the wonders of color, and the brilliant effects of light which we see in the skies and call Auroras, or Northern and Southern Lights.

very equal temperature, and have a tendency to moderate both heat and cold, wherever their influence extends. Thus when a cold wind passes over the sea, it becomes warmed, while a hot wind becomes cooled; and thus islands generally experience milder winters and more temperate summers than continents. Such countries are said to possess an insular climate. But when any region experiences great severity of cold in winter and a high degree of heat in summer, it is said to possess an extreme or excessive climate. The most striking instances of an extreme climate are drawn from places like Yakutsk, situated in the depths of Siberia, where the difference between the average temperature of winter and summer amounts to the astonishing sum of 101 degrees Fahrenheit.

INFLUENCE OF ELEVATIONS

A gradual decrease in temperature takes place in the ascent from the sea to the line of perpetual snow. This line, which is called the snow-line, varies in different latitudes, and sometimes, owing to local causes, differs on the same latitude; as a general rule, however, a gradual decrease in elevation of the snow-line takes place as we recede from the equator north and south. The height of this line within the tropics varies from 16,000 to 17,000 feet above the level of the sea, and in the northern hemisphere meets the level at about the eightieth parallel.

MODIFICATIONS BY PREVAILING WINDS, MOUNTAINS AND OCEAN CURRENTS

Countries where the prevailing winds sweep across a wide expanse of ocean are not subject to extremes of heat and cold. Thus the climate of oceanic islands is always moderate, and the climates of all coasts are more equable than in the interior of continents.

Climate is also modified greatly by the position of mountain ranges, especially when ridges extend east and west, screening it from the north or leaving it exposed unsheltered in that direction.

Thus the Carpathians screen Hungary from the cold blasts of the north; while Poland, to the north of that range, and therefore unprotected from those piercing winds, suffers from a very cold and humid atmosphere.

The currents of the ocean are likewise potent agents in the formation of climates, and render places which would otherwise be uninhabitable, fit for man's habitation. Thus the Polar currents coming to the equatorial regions cool, and the Gulf Stream making its way to Polar regions warms, otherwise extreme temperatures.

RAINLESS AND RAINY REGIONS OF THE EARTH

In some parts of the Earth extensive tracts exist where rain is never known to fall, and if at all only at intervals, and then in small quantities. The rainless districts of the New World include the flat territories of northern Chili and Peru, some parts of Mexico, and some parts of California. In the Old World an extensive rainless band extends from the western shores of Africa to the central regions of Asia, including the Great Sahara Desert, Egypt, part of Arabia, and the Desert of Gobi. Countries so circumstanced, unless like Egypt rendered fertile by the irrigation of a great river, constitute the most arid and desolate regions of the earth.

The quantity of rain which falls in any region depends greatly on local causes, such as the variations of the surface, the prevailing winds or the proximity of the ocean. Rain is usually more copiously deposited in mountains and well-wooded islands than in any other description of surface.

In tropical regions the rains follow the sun, i. e., when the sun is north of the equator, the rains prevail in the northern tropic, and when south of that line in the southern tropic. This forms the rainy and dry seasons to which countries so situated are subject. This does not, however, apply to the whole intertropical regions, for in a zone extending from the fifth to the tenth parallels on each side of the equator there are two rainy and two dry seasons.

In the narrow belt called the variables, between the regions of the north and south trade-winds, rain is almost incessant, accompanied by thunder and lightning. In many parts of the intertropical regions during the rainy season the rain pours down in such torrents that a larger quantity falls in a few hours than in a whole month in temperate North America.

TRAVELERS GROUPED ON THE SANDS OF THE SAHARA, TERRORIZED BY AN APPROACHING SIMOON

The dreaded Simoon of the desert is a whirlwind of terrific force that raises great gyrating clouds of sand, and sweeps forward with suffocating effect upon both man and beasts. It frequently darkens the sky at midday, and sometimes lightning accompanies it caused by the friction of the sand and air, though no rain falls. The Simoon seldom lasts more than twenty minutes.

NATURE WONDERS OF ELECTRICITY AND LIGHT

Electricity produces an infinity of changes in the natural world. It may be artificially elicited or called forth by friction; or by contact of certain substances and the action attendant on this contact. In the one case it is termed ordinary, and in the other case voltaic or galvanic electricity.

All substances are supposed to contain a certain portion of electricity, and if by friction or other means any substance acquires more electrical action than it would naturally possess, it is said to be positively electrified; and if less, it is said to be negatively electrified. Substances when positively electrified attract or draw toward them other substances which are in a state of negative electricity, or even those which are in a natural state, but will repel or force from them substances which are positively electrified. The sudden contact of bodies in an opposite state of electricity is attended with vivid light called the "electric spark," and accompanied by explosion and shock.

EARTH AND AIR FORM NATURE'S ELECTRIC BATTERY

The earth is always in a state of positive electricity, and the air when pure in a state of negative electricity. Atmospheric air, however, is subject to incessant variations, and hence its "electrical equilibrium" or natural electrical state is subject to be disturbed. This equilibrium will be restored when an explosion has taken place, and thus it is that in peculiar states of the atmosphere thunder storms act a beneficial part in restoring the air to a normal condition. The intensity of electrical action is greater during the day than at night and also in summer than in winter; and diminishes from the equator to the poles.

Electricity is perpetually effecting great changes in the earth's crust, and in very many instances acts on the principal of voltaic electricity, the action in such cases being produced by long-continued currents.

LIGHTNING—THE ELECTRICAL DISCHARGE IN THE HEAVENS

Lightning is the dazzling light produced by an electrical discharge passing between clouds which are oppositely electrified, or between the clouds and the earth. Lightning flashes have been distinguished as zigzag or chain lightning sheet and globular lightning.

The first has the aspect of a sharply defined chain of fire, and moves at the rate of 250,000 miles per second. Its zigzag course is attributed to the resistance of the air, condensed in the passage of the electrical discharge, which is sufficient to turn it aside frequently in the direction of less resistance.

Sheet lightning includes the expanded flashes which occur during a storm, and the heat lightning, seen on summer evenings, when no clouds are visible, which is supposed to be the reflection of a storm taking place below the horizon.

Globular lightning is seen on rare occasions, when the electrical discharge takes the form of a ball of fire, and descending with less rapidity, is visible for several seconds. In certain conditions of the atmosphere, globes or spires of electrical light, called St. Elmo's fire, are seen tipping the extremities of bodies in contact with the earth, like church spires, or masts of ships.

All the conditions which give rise to electrical excitement in the atmosphere are much more intense in warm than in cold latitudes; hence the thunder storms of the tropical regions greatly exceed, both in frequency and in violence, those of temperate and cold climates.

THE AURORA BOREALIS, OR NORTHERN LIGHTS

This phenomenon is frequently observed in the northern heavens. It occurs in many forms, but the most common is that of a luminous arch whose summit is in the magnetic meridian of the place of observation, and from which vivid flashes of light dart towards the zenith. A like phenomenon in the southern heavens is denominated the Aurora Australis. Auroras are most frequent and brilliant in the polar regions, and diminish in intensity towards the equator.

RAINBOWS, HALOS AND CORONAS

Rainbows are arches of prismatic colors, formed by the reflection of rays of light from within drops of water. The rays, which are refracted in entering the drops, are reflected from their posterior surfaces, and again refracted as they re-enter the air, the colors being separated by their unequal refrangibility,

Halos and coronas are circles of prismatic colors which, in certain states of the atmosphere, surround the Sun and the Moon.

Halos are supposed to be occasioned by the presence, in the atmosphere, of small ice crystals which act as minute prisms, decomposing and refracting the light which passes through them.

Coronas are seen when a light mist is floating in the air, and are supposed to be formed by reflection from the external surface of the globules of vapor.

COLORS OF THE SKY AND CLOUDS

The azure tint of the cloudless sky is due to the decomposition and refraction of light, as it passes through layers of air successively increasing in density. The blue and violet, being more refrangible than other colors of the solar spectrum, are diffused through the atmosphere; and being reflected from its particles, they impart to it their own color.

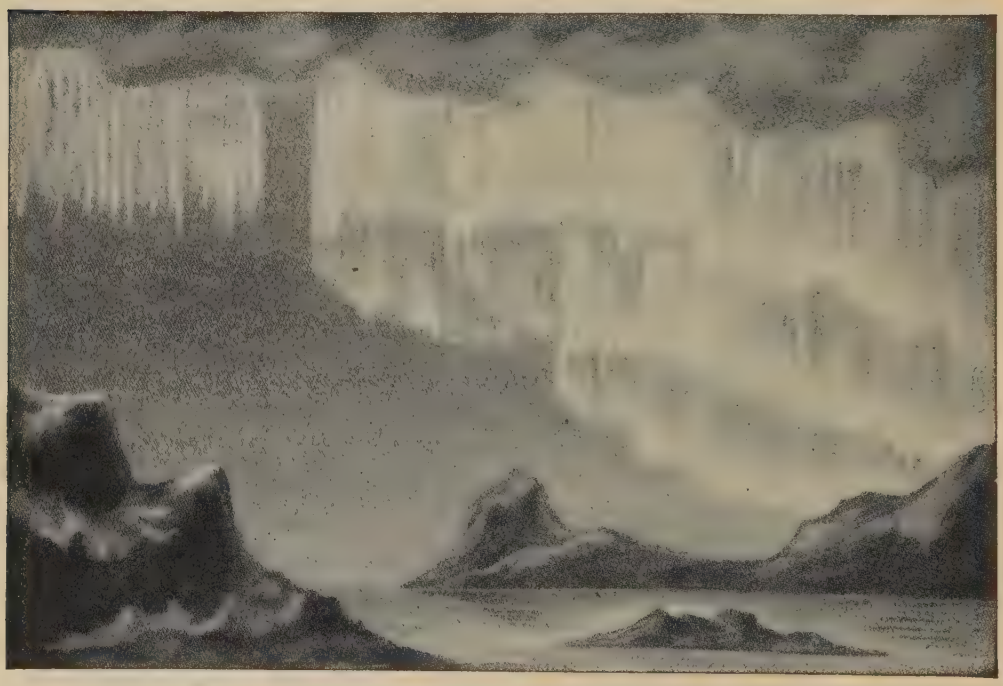
The clouds, floating in the atmosphere, absorb the more refrangible rays, and reflect the less. At sunrise and sunset, when the light traverses the greatest depth of atmosphere, all the colors are absorbed except the red and the yellow; and these, being deflected from the particles of vapor, produce the brilliant coloring of sunrise and sunset.

THE MYSTIFYING MIRAGE

The mirage is an optical phenomenon in which images of distant objects are seen, reflected beneath, or suspended in the heavens above. Occasionally, also, objects are seen double, being repeated laterally instead of vertically.

The mirage is caused by the refraction and reflection of light as it passes from denser to rarer strata of air. It is most frequent in arid plains, where the soil, exposed to the burning rays of the sun, becomes intensely heated, and, in consequence, the strata of air near the ground are less dense than those above.

In this case rays of light passing from any distant object, as a tree, to the ground, are refracted more and more towards the horizontal, until finally they are reflected from a horizontal layer of the heated air, and reach the eye from beneath. Then an image of the object is seen as if mirrored in the tranquil waters of a lake.



THE MAGNIFICENT CURTAINS OF LIGHT THAT FORM THE AURORA BOREALIS

USEFUL MINERALS OF THE EARTH

HOW MINERALS ARE IDENTIFIED

Minerals can be identified and distinguished by various physical properties and by ascertaining their chemical composition. The chief distinguishing physical properties are crystalline form, cleavage, hardness, and specific gravity.

Each mineral or special class of minerals has its own definite geometrical shape or crystalline form. The crystals of each mineral have also a tendency to break or cleave most readily in a particular direction. The term hardness, as applied to minerals and other solid bodies, is used to indicate resistance to being scratched or the power to scratch. The harder of two bodies is the one which will scratch the other, and which resists being scratched by that other.

CRYSTALS THE MOST BEAUTIFUL OF MINERAL FORMS

There are three general classes of crystals—calcareous, silicious and gypsum—but by far the most important are the silicious crystals because of their great hardness. These include quartz or rock crystal—which is quite common—and the so-called *precious stones*, among which are the diamond, rubies, sapphires, etc., a description of which will be found in the Dictionary of Minerals.

To find the relative hardness of substances, a scale has been arranged, beginning with the softest mineral (talc) and ending with the hardest (diamond). The minerals of the scale, therefore, are so arranged that each will scratch any other mineral of lower number in the scale, or be scratched by any of higher number.

SCALE OF HARDNESS

MINERAL		CHEMICAL NAME
1. Talc.	Can be scratched by the finger-nail	1. Magnesium silicate.
2. Gypsum and rocksalt.		2. Calcium sulphate or Sodium chloride.
3. Calc-spar.	Can be scratched by knife or file	3. Calcium carbonate.
4. Fluor-spar.		4. Calcium fluoride.
5. Apatite.		5. Calcium phosphate.
6. Felspar.		6. Potassium and aluminum silicates.
7. Quartz (rock-crystal).	Cannot be scratched by knife or file	7. Silica.
8. Topaz.		8. Aluminum fluorsilicate.
9. Corundum (sapphire, ruby).		9. These gems are crystallized alumina.
10. Diamond.		10. Crystallized carbon.

As a first inquiry into the chemical composition of a mineral, dilute hydrochloric or sulphuric acid is tried. All *carbonates* effervesce when placed in acid or when acid is dropped upon them, while quartz and all the *silicates* show no effervescense when so treated.

The table on pages 104-7 contains a brief description of the distinctive physical features of a number of the very common or important minerals.

DICTIONARY OF IMPORTANT MINERAL PRODUCTS

Aluminum, a metal which does not occur in nature in the free state, but for the most part in combination with silica, as a silicate of aluminum, in clay and many minerals. As extracted from clay by a series of very difficult chemical operations, it forms a white metal, very ductile and malleable, and susceptible of a high polish. On account of its lightness, aluminum is highly valued; it forms excellent alloys.

Bauxite (aluminum hydrate) is the only ore. It is mined in France, Ireland, Austria, Arkansas, Alabama and Georgia, and is refined by electric processes. It is used largely as an addition to iron and steel, preventing bubbles and waste in castings; in electrical work, and for purposes where a light, strong metal is necessary, as in certain machinery, hulls for small boats, etc. Refineries are located in Switzerland, France, Great Britain and United States.

Cryolite (fluoride of aluminum and sodium), a mineral mined only in Greenland, was formerly used as an ore but is now utilized in the manufacture of alum and soda.

Alum (a sulphate) is made from cryolite or clays.

Corundum (aluminum oxide) is, next to the diamond, the hardest natural mineral. Canada, North Carolina, Alabama and India have mines of corundum. Emery is produced chiefly in Greece and Asia Minor. Corundum and emery are powdered for use as abrasives in wheels, sharpening stones, polishing powder and cloth.

Emery is an impure form of corundum.

Feldspar is a silicate of aluminum with other metals. It is mined in Canada, Pennsylvania, Connecticut, New York, Maine and Norway, and ground up for use in pottery making.

Clay is chiefly silicate of aluminum and other metals. *Kaolin* is its purest form. The properties of clay vary with its composition, as china clay, fire clay, pipe clay, brick clay. Clays are found in all parts of the world as a result of the decomposition of other rocks.

The location of manufacturing centers of pottery of all kinds and of bricks, is dependent on clay deposits. In pottery making, Ohio, New Jersey and Pennsylvania lead the United

TABLE FOR THE IDENTIFICATION OF COMMON MINERALS; THEIR

Name of Mineral	Common Name	Composition	Hardness	Lustre	Color	Streak	Cleavage or Fracture
Amphibole (*ăm'fĭ-bōl*)		Silicate of magnesium, calcium, aluminum, iron, etc.	5-6	Glassy to dull.	Black or light to dark green.	White	Perfect in two directions at angle of 124°.
Arsenopyrite (*ăr'sĕn-ō-pŭr'it*)	Mispickel.	Sulphide and arsenide of iron.	6	Metallic.	Silver, yellowish, or light grayish white.	Black.	Good in two directions at an angle of 112°. Not evident on fine grained material.
Barite. (*bā'rit*)	Barytes. Heavy spur.	Sulphate of barium.	3	Glassy to stony.	White, yellow, blue or brown.	White.	Perfect in one direction; two other good cleavages at right angles to the first and at 101° with each other.
Biotite. (*bī'ō-tīt*)	Black Mica.	Hydrous silicate of aluminum, potassium, magnesium and iron.	2½-3	Glassy to almost metallic.	Black or dark brown.	White.	Very perfect in one direction, yielding thin sheets.
Calcite. (*kăl'sīt*)	Lime. Calcspar.	Carbonate of Calcium.	3	Glassy to earthy.	Colorless or white when pure, all colors when impure.	White	Perfect in three directions at angles of about 105° or 75°.
Chalcocite. (*kăl'kō-sīt*)	Copper Glance.	Sulphide of copper.	3	Metallic; dull when impure or tarnished.	Dark gray. Tarnishes black or green.	Lead-gray.	No cleavage, smooth conchoidal fracture.
Chalcopyrite. (*kăl'kō-pīr'it*)	Copper Pyrites. Fools gold.	Sulphide of copper and iron.	4	Metallic.	Bright brass-yellow. Often tarnished iridescent.	Greenish black.	No cleavage. Uneven fracture.
Copper.		Native metallic copper.	2½-3	Metallic.	Copper-red. Tarnishes green to black.	Copper-red.	No cleavage. Hackly fracture.
Corundum. (*kō-rŭn'dŭm*)		Oxide of aluminum.	9	Glassy.	All colors; usually gray or brown when massive.	White.	Often parts readily into almost rectangular pieces whose faces are cross-hatched.
Epidote. (*ĕp'ĭ-dōt*)		Basic silicate of calcium, aluminum and iron.	6-7	Glassy to dull.	Dark green or greenish brown (crystals) to light yellowish green.	White.	Perfect in one direction.
Fluorite. (*flōō'or-it*)	Fluor Spar. Fluorine.	Calcium fluoride.	4	Glassy.	All colors; green violet, purple, colorless and white, the commoner.	White.	Cleaves easily into octahedrons, i. e., in four directions, at angles of 109° or 71°.
Galenite. (*gā-lē'nīt*)	Galena. Lead.	Sulphide of Lead.	3	Metallic.	Bluish lead, gray. Tarnishes black.	Lead-gray.	Perfect cubical, i. e., in three directions at angle of 90°.
Garnet.		Silicate of various elements: calcium, aluminum and iron are commonest.	6½-7½	Glassy to resinous.	Commonly some shade of red; also brown, yellow, white, black green.	White.	No cleavage. Uneven fracture.
Gold.		Native metallic gold with a little silver, copper, etc.	2½-3	Metallic.	Golden yellow to nearly silver-white.	Yellow to nearly white.	No cleavage. Hackly fracture.
Graphite. (*graph'it*)	Black Lead. Plumbago.	Carbon.	1-2	Metallic to dull.	Dark gray to black.	Dark gray.	Perfect in one direction. Cleavage faces are apt to be curved. Not shown if finely granular.
Gypsum. (*jĭp'sŭm*)		Hydrous sulphate of calcium.	1½-2	Pearly, silky, vitreous, dull.	White, gray, red, yellow or other tints due to impurities.	White.	Very perfect in one direction; two others show as cracks at angle of 114°, on the perfect cleavage faces.
Halite. (*hā'lit*)	Rock salt.	Chloride of solium.	2½	Glassy.	Colorless or white when pure. Yellow, brown, red, etc., when impure.	White.	Perfect cubic, i. e., in three directions at angle of 90°.
Hematite. (*hēm'ā-tīt*)	Red oxide of iron.	Oxide of iron.	5½-6½	Metallic to earthy.	Black when metallic; reddish black when dull, red when earthy.	Red.	No cleavage; may have a parting in one direction producing a platy structure. Uneven fracture.
Limonite. (*lĭ'mŏn-it*)	Yellow oxide of iron.	Hydrous oxide of iron.	5-5½	Dull, silky, varnish-like.	Yellow, brown or nearly black.	Yellow or yellowish brown.	No cleavage. Uneven fracture.
Magnetite. (*mag'net-it*)	Magnetic iron ore.	Oxide of iron.	5½-6½	Metallic to dull.	Iron-black.	Black.	No cleavage. Sometimes parts in four directions at angles of 109° and 71°. Uneven to subconchoidal fracture.

SCIENTIFIC AND COMMON NAMES AND CHIEF CHARACTERISTICS

Crystallization and Occurrence	Tenacity etc.	Diaphaneity	Varieties	Remarks
Prismatic crystals with hexagonal cross-section, common; also cleavable masses.	Brittle to tough.	Opaque to transparent.	Actinolite (green, transparent), Asbestos (fibrous, dull). Hornblende (black).	Common constituent of igneous and metamorphic rocks. Valueless.
Crystals resemble a double-edged axe. Occurs also coarse to fine granular.	Brittle.	Opaque.		Principal ore of arsenic and sometimes carries gold. Gives sparks and garlic odor when struck with a hammer. Yellow tarnish.
Diamond shaped or rectangular tabular, or prismatic crystals and platy masses.	Brittle.	Transparent to translucent.		Used to adulterate white lead and give weight to paper. Often associated with lead ores. Very heavy.
Six-sided tabular crystals, and as scales, plates, or scaly masses.	Flexible and elastic.	Opaque to transparent.		Common constituent of igneous rocks. May be brittle when altered. Valueless.
Prismatic or tabular six-sided crystals; also granular, cleavable, or earthy masses.	Brittle.	Transparent to opaque.	Marble (granular). Limestone (dull, compact). Chalk (soft, white, earthy). Mexican Onyx (compact, banded).	Effervesces vigorously in hydrochloric acid of any strength and temperature. Used as flux, building or ornamental stone, to make lime, etc.
Usually very compact masses; six-sided, tabular crystals rare.	Slightly sectile.	Opaque.		An important ore of copper. Cuts easily, yielding a highly polished surface.
Occurs massive or in scattered particles. Crystals usually have four triangular faces.	Brittle.	Opaque.		One of the most important ores of copper and often carries silver and gold. Is often mistaken for the latter.
Masses, plates, scales, branching aggregates and octahedral crystals, usually distorted.	Malleable sectile.	Opaque.		The value and uses of copper are well known Often carries some silver.
Prismatic or tabular six-sided crystals; also granular and pseudo-cleavable masses.	Brittle to tough.	Translucent to transparent.	Ruby (red). Sapphire (blue, etc.). Adamantine. Spar (massive). Emery (granular, impure).	A very valuable gem mineral and a fine abrasive. See plate 1, figures 10, 11 and 13.
Slender, deeply grooved prismatic crystals and cleavable to fine granular masses.	Brittle.	Transparent to opaque.		Common constituent of metamorphic rocks. Rarely cut as a gem.
In groups of crystals, usually cubical; also in cleavable masses. Sometimes granular.	Brittle.	Transparent to translucent.	Rock fluorite (finely granular and usually very impure and hard).	Used as a flux in smelting ores, and in several arts and trades.
Cubical crystals, often with triangular faces on the corners; also, cleavable to granular masses.	Very Brittle.	Opaque.	Steel galena (very fine grained masses). Often rich in silver.	Most important lead and silver ore. Often contains the latter metal with sometimes gold and other elements.
Complex, rounded crystals, glassy masses and granular.	Brittle.	Transparent to opaque.		An important abrasive and a beautiful gem. Found in metamorphic rocks. See plate I, figures 8 and 15.
Nuggets, plates, scales, wires: branching aggregates and distorted crystals, usually octahedral.	Malleable sectile.	Opaque.	Based upon and named after any impurities that may be present.	The value and uses of gold are well known
Imbedded scales and foliated, granular or compact masses. Rarely in six-sided, tabular crystals.	Sectile Flexible.	Opaque.		Used in the manufacture of lubricants, infusible crucibles, and "lead" pencils.
Diamond shaped crystals, and cleavable, fibrous, granular, foliated or compact masses.	Sectile, Thin flakes flexible.	Translucent to transparent.	Selenite (cleavable, transparent). Satin spar (white, fibrous, silky). Alabaster, (white, fine grained.)	Is carved into vases, statues, etc., and forms plaster of paris when calcined and ground. Is a precipitate rock.
Cubical or octahedral crystals; also cleavable, granular or compact masses.	Brittle.	Translucent to transparent.		Tastes salty. Enormous quantities are used to season food, in various arts and trades, and as a source of sodium and its salts. A precipitate rock.
Complex, tabular or rounded crystals; also platy, oolitic, earthy, micaceous, and kidney shaped masses.	Brittle.	Opaque.	Specular iron (mirror-like plates or crystals). Red Ochre or Ruddle (red, earthy).	The most important ore of iron, and is also used to make cheap paint, polishing powder, etc.
Botyroidal or stalactitic forms with a radiating fibrous structure and a varnish-like surface, also earthy masses and concretions.	Brittle.	Opaque.	Bog iron ore (porous, earthy, often encloses vegetation). Yellow ochre or umber (earthy with clay, etc.).	Commonest, but most impure ore of iron, and is also used to make cheap yellow and brown paint.
Octahedral crystals, and coarse to fine granular, laminated, or compact masses.	Brittle.	Opaque.	Lodestone (a natural magnet).	The only black, brittle, magnetic mineral, and a very pure and valuable ore of iron.

TABLE FOR THE IDENTIFICATION OF COMMON MINERALS; THEIR SCIEN

Name of Mineral	Common Name	Composition	Hardness	Lustre	Color	Streak	Cleavage or Fracture
Malachite. (*măl'ȧ-kīt*)		Hydrous carbonate of copper.	3½-4	Silky to dull.	Green, often nearly black on exposed surfaces.	Green. Paler than the color.	No cleavage. Uneven fracture.
Muscovite. (*mŭs'kǫ-vīt*)	Mica, isinglass. White Mica.	Hydrous silicate of potassium and aluminum.	2-2½	Glassy. Pearly on cleavage faces.	White or light tints of other colors, particularly gray, brown or green.	White.	Very perfect in one direction, yielding thin sheets.
Orthoclase. (*ôr'thǫ-klās*)	Feldspar. Potash. Feldspar.	Silicate of potassium and aluminum.	6	Glassy to stony.	Flesh-red, gray, yellow, white or colorless.	White.	In two directions at angle of 90°, one direction slightly less perfect than the other.
Pyrite. (*pīr'it*)	Pyrites. White iron. Fools gold.	Sulphide of iron.	6-6½	Metallic.	Pale to deep brass-yellow. Tarnishes brown or iridescent.	Black.	No cleavage. Conchoidal to uneven fracture.
Pyrolusite (*pīr'ǫ-lū'sīt*)		Oxide of manganese.	1-2½	Metallic to dull.	Black to dark steel-gray.	Sooty black.	May appear to have good cleavage in one direction but usually shows none.
Pyroxene. (*pīr'ŏks-ēn*)		Silicate of magnesium, calcium, aluminum and iron.	5-6	Glassy to dull.	Black or light to dark green.	White to greenish.	Poor in two directions at angle of nearly 90°. May have a fine platy parting.
Quartz. (Phenocrystalline).		Oxide of silicon.	7	Glassy.	White or colorless when pure. Any color when impure.	White or light tints.	No cleavage. Single crystal has conchoidal fracture, otherwise the fracture is uneven.
Quartz. (Cyptocrystalline).				Dull to earthy.			No cleavage. Conchoidal fracture.
Serpentine. (*sĕr'pĕn-tīn*)		Hydrous silicate of magnesium and iron.	4+	Wax-like, silky, earthy.	Light to dark green, yellow, brownish red, variegated.	White.	No cleavage. Conchoidal fracture when massive.
Siderite. (*sĭd'ĕr-īt*)		Carbonate of iron.	3½-4	Glassy to earthy.	Light to dark brown or gray. Tarnishes reddish brown or brownish black.	White to yellowish.	Very perfect in three directions at angle of 107° and 73°. Not evident when fine grained.
Sphalerite. (*sfăl'ĕr-īt*)	Blende, Jack Rosin zinc, zinc, etc.	Sulphide of zinc.	3½-4	Resinous to nearly metallic.	Commonly yellow, brown, black or red; sometimes green or white.	White, yellow or brown.	Very perfect in six directions at angles of 60°, 90° and 120°.
Stibnite. (*stĭb'nīt*)		Sulphide of antimony.	2	Metallic.	Light gray. Cleavage faces appear silver white when reflecting light.	Lead-gray.	Perfect in one direction yielding blade-like strips which are bent or hatched perpendicular to their length.
Talc. (*tălk*)	Talcum.	Hydrous silicate of magnesium.	1-1½	Waxy to dull. Pearly on cleavage faces.	White, light green, gray; other colors when impure.	White to greenish.	Perfect in one direction, yielding thin flexible plates. Not shown on the fine grained soapstone.
Tetrahedrite. (*tet'ra-he'drit*)	Gray copper.	Sulph - antimonite of copper.	3-4½	Metallic.	Gray.	Gray, brown, or reddish.	No cleavage. Uneven, granular fracture.
Tourmaline (*tōōr'mȧ-lĭn*)	Schorl.	Silicate of boron and various other bases varying with the variety.	7-7½	Glassy to resinous.	All colors. Interior and exterior or opposite ends of a crystal may differ in color.	White.	No cleavage. Uneven to poor conchoidal fracture.
Zoisite (*zois'īt*)		Silica, alumina, lime, peroxide of iron, water.	6	Pearly	White, gray, yellow, brown.	Uncolored.	Parallel cleavage; sometimes fibrous.

TIFIC AND COMMON NAMES AND CHIEF CHARACTERISTICS — Continued

Crystallization and Occurrence	Tenacity etc.	Diaphaneity	Varieties	Remarks
Massive, as botryoidal crusts with a radiating structure and silky lustre, and as slender crystals forming velvety surfaces.	Brittle.	Translucent to opaque.		Is an ore of copper and is used as an ornamental stone and in jewelry. Azur-malachite is malachite mixed with blue azurite. See plate I, figure 4.
Six-sided, tabular crystals, and as scales, plates, or scaly masses.	Flexible and elastic.	Transparent to translucent.		Used in stove doors, as insulation in electrical apparatus, and for spangling or frosting paper and fabric.
Thick-set square or six-sided crystals, or cleavable masses or grains.	Brittle.	Transparent to opaque.	Sanadine (transparent crystals or grains imbedded in igneous rocks).	Associated with quartz and mica in many rocks. Used in making glass and porcelain. Next to quartz in frequency of occurrence.
Cubical, octahedral, or complexly rounded crystals, coarse to fine granular, and massive.	Brittle.	Opaque.		Used in making sulphuric acid and often contains so much gold, silver and copper as to make it an ore of these metals.
Occurs as radiating prismatic layers, velvety crust and granular to compact masses. Soils the fingers.	Brittle.	Opaque.		Has many uses and is valuable. Usually associated with a very fine grained, hard, black mineral that is often botryoidal.
Prismatic crystals with square or octagonal cross-section; also foliated and massive.	Brittle.	Transparent to opaque.	Diopside (light green, glassy). Diallage (light green, dull, foliated). Augite (black).	A common constituent of igneous rocks. Diopside is sometimes used as a gem.
Six-sided prism terminated by a six-faced pyramid; also massive, coarse to fine granular, and as sand.	Brittle.	Transparent.	Rock crystal (colorless, transparent). Amethyst (purple). Rose (pink). False topaz or Citrine (yellow). Smoky quartz or Topaz (brown or gray). Milky (white). Ferruginous (iron stained).	The commonest of all minerals. A constituent of most rock. Great quantities are used as a flux in smelting, as abrasives, and in the manufacture of glass and porcelain. The transparent varieties of pleasing tints are used as gems. Water-clear spheres are very valuable.
Very fine grained massive, botryoidal, nodular, or filling or lining cavities in rocks.	Brittle.	Translucent to opaque.	Chalcedony (drab). Carnelian (red, translucent). Jasper (red, brown, yellow, opaque). Heliotrope or Bloodstone (dark green with red spots). Flint (dark gray concretions). Agate (banded or particolored). Onyx (agate with flat layers). Petrified wood (wood replaced by quartz).	
Compact, massive or coarse to fine fibrous. The two habits are often in parallel layers.	Tough Fibres are flexible.	Translucent to opaque.	Precious or noble (massive, translucent). Chrysolite (silky, fibres). Verde antique (massive with calcite).	Chrysolite is the best commercial asbestos. Other varieties are used as ornamental stone and occasionally in jewelry.
Cleavable masses, coarse to fine, granular and at warped crystals that resemble distorted cubes.	Brittle.	Translucent to opaque.	Sphaerosidirite or Clay-ironstone (concretions of fine grained siderite mixed with clay).	The most valuable ore of iron, but is rather uncommon. The impure clay-ironstone is fairly common in sediments.
Complexly rounded or modified cubical crystals; also cleavable, coarse to fine granular masses, and botryoidal, etc.	Brittle.	Transparent to opaque.		The commonest zinc ore and an impure variety furnishes most of the cadmium of commerce. Associated with galenite and silver minerals.
Sharp, vertically grooved, prismatic crystals and in cleavable masses with a bladed structure.	Very brittle.	Opaque.		The chief source of antimony and its salts. Sometimes carries gold and silver.
Foliated, coarse to fine granular, or compact masses. Feels greasy to soapy.	Tough sectile.	Transparent to translucent.	Steatite or soapstone (granular, impure hardness up to 2½). French chalk (white, fine grained, soft).	Used in making porcelain, polishing powder, lubricants, gas jets, tinted plasters, paper, soap, leather dressing, talcum powder, slate pencils, and in other ways.
Crystals have four triangular faces. Occurs usually granular massives.	Brittle.	Opaque.		Often contains enough silver to make it a valuable ore of this metal as well as copper.
Vertically lined, prismatic crystals with spherical triangular cross-sections. Also columnar or compact massive.	Very brittle.	Transparent to opaque.	Schorl (black). Rubellite (pink). Indicolite (blue). Achroite (white).	A popular semi-precious gem. When heated (not above 212° F.), will usually pick up bits of paper. Opposite ends of crystals have different forms.
Occurs in tri-metric crystals; also massive.	Brittle.	Transparent, translucent.		Often a constituent of metamorphic rocks.

States. Abroad, fine china is made in France, Germany, Austria, England, Japan, and China.

Antimony and Bismuth. Antimony is produced in Germany, France, Italy, Hungary, United States, Japan and other countries.

Bismuth comes mainly from Bolivia and Australia. Some is produced in Saxony and England.

Stibnite (antimony sulphide) is the chief ore of antimony. Bismuth occurs in small amounts in a pure state and also combined with sulphur.

These metals form many alloys such as type metal, anti-friction metals, white metal, babbitt metal, fusible metals.

Tartar emetic and other antimony compounds are used in medicine and dyeing.

Amber is a fossil resin found chiefly along the shores of the Baltic. It is used in making mouthpieces for pipes, cigar holders, beads and other articles.

Arsenic. Germany, England, Canada, the United States and Spain produce the ores. Chemical laboratories transform them into the useful compounds.

Arsenopyrite (arsenic and iron sulphide), orpiment and realgar (sulphides of arsenic) and the sources of arsenic.

Arsenic (white arsenic, arsenious acid or oxide of arsenic), paris green and other compounds and salts are prepared.

Ship dip, rat poison, insecticides, embalming fluid, pigments and dyes are prepared with arsenic compounds. Arsenic salts are used in preparing certain coal-tar colors.

Asphaltum (or mineral pitch) is a bituminous mineral substance found more or less pure, in some localities. The pitch lake of Trinidad and the Bermudez lake at the mouth of the Orinoco in Venezuela, are the largest known deposits of moderately pure asphalt. Smaller deposits of high grade occur in Utah, Cuba and the Barbadoes.

Rock asphalt consists of sandstone or limestone impregnated with asphalt. Much asphalt is produced in refining certain grades of petroleum—such as those obtained in California and Texas.

Rock asphalts are mined in France, Switzerland, Sicily, California, Kentucky and Oklahoma.

For paving rock asphalts are much used in Europe. Trinidad and Venezuelan asphalts are exported in large quantities to the United States and Europe. For paving, these lake asphalts are mixed with broken stone, sand and petroleum residuum.

Pure varieties (gilsonite, marjak, glance pitch) are made into black varnish, used for insulating, etc.

Barium is mined in the United States and Germany.

Barytes or barite is a heavy, white mineral (barium sulphate). It is used as a substitute or adulterant for white lead in paints, and in making oxygen.

Bismuth. See antimony.

Building Stones are quarried for local use in all parts of the world.

Granite, syenite, gneiss, basalt and other hard or durable rocks.

Only stone of exceptional beauty is shipped to a great distance. Scotland, Norway, Massachusetts, Maine and other localities produce fine stones.

Calcium has no commercial use in the metallic state. Its compounds, both natural and artificial, are of great economic importance.

Limestone (calcium carbonate) is a very common rock used for building. It may be of almost any color and coarse or fine in texture. It is found and utilized in all parts of the world. In the United States, Pennsylvania, Illinois, Ohio, Indiana, New York and Missouri are the chief producers.

Lime is used in chemical industries and mortar.

Marble is a name applied to limestones suitable for polishing or ornamental work. *Mexican onyx* is translucent. Fine marbles are quarried in Italy, Egypt, France, Spain and Greece. Vermont, Georgia, Tennessee and New York supply the greater part of the marble used in the United States. Handsome marbles are imported from Carrara, Italy, and other parts of Europe. Mexican onyx is also imported.

Chalk comes mainly from the south of England. We export some Portland cement and import a little from Europe.

Chalk is of peculiar soft texture; *whiting* is prepared chalk used to make putty and paints; *precipitated chalk* is similar.

Lime is made by burning (calcining) common limestones. *Portland* and *hydraulic cements* are prepared by calcining siliceous limestones or a mixture of limestone and clay. They are of enormous commercial importance, being used in concrete construction work. Europe and the United States produce large quantities. Pennsylvania is the leading state in this industry.

Buildings (both commercial and residences) are now being extensively constructed of cement—in the former case being re-enforced by iron rods.

Chloride of lime (or bleaching powder), *acetate of lime, calcium carbide* and many other compounds are of industrial value.

Gypsum (hydrous calcium sulphate) is used in fertilizers. Plaster is prepared by calcining (burning) gypsum. *Plaster of paris* is its purest form. *Alabaster* is compact white gypsum. It is a common mineral mined in many parts of the world. Michigan, Kansas, New York, Ohio and other states produce it. Fertilizers and plaster use up large quantities of this mineral. Plaster of paris is used for casts, decorative plaster work, cement, etc.

Fluorite (calcium fluoride) is a less common mineral. Mined in England, Kentucky and Illinois. It is used in chemical manufacture and as a flux for ores.

Phosphate rock (chiefly calcium phosphate) is important in the preparation of fertilizers, and chemicals containing phosphorus. It is found in deposits of organic origin in South Carolina, Florida, Tennessee, the West Indies, Canada, Spain, France, Germany and England.

The natural phosphates are treated with sulphuric acid as a first step in the manufacture of phosphatic fertilizers. Exported in large amount to Germany, England and other countries.

Carborundum, or carbide of silicon, is harder than any known substance but the diamond.

Much is manufactured at Niagara Falls, by electrically heating a mixture of coke, sand and salt. It is used for making polishing powder, in grinding wheels, sharpening stones, abrasive cloth, etc.

Cereum. See rare metals.

Chrome is mined in Asia Minor, Greece, Canada, New Caledonia and California. Its salts are prepared in chemical laboratories.

Chromite (oxide of chromium and iron) is the only ore.

Bichromate of potash is the most important compound. It, together with chromic acid, is used in tanning soft leather. A small percentage added to steel makes it very hard and suitable for burglar-proof safes, tools, etc. Salts of chrome are used for dyes and pigments, such as chrome yellow, chrome green, etc.

Coal is one of the most important of all rocks and first among fuels. It consists chiefly of carbon, and is universally regarded as of vegetable origin.

Several theories as to the origin of coal have been put forth from time to time. The one now generally accepted is that the rank and luxuriant vegetation which prevailed during the carboniferous age grew and decayed upon land but slightly raised above the sea; that by slow subsidence this thick layer of vegetable matter sank below the water, and became gradually covered with sand, mud, and other mineral sediment; that then, by some slight upheaval or gradual silting up of the sea bottom, a land surface was once more formed, and covered with a dense mass of plants, which in course of time decayed, sank, and became overlaid with silt and sand as before. At length, thick masses of stratified matter would accumulate, producing great pressure, and this, acting along with chemical changes, would gradually mineralize the vegetable layers into coal.

In passing from wood or peat to coal, the proportion of carbon increases, while that of oxygen and hydrogen decreases, these substances being given off in the form of marsh-gas and carbonic acid gas in the process of decay.

Deposits occur in almost all parts of the world, but many are almost entirely undeveloped; as, for example, the coal fields of China. The largest production is in the United States, Wales, England, Germany, Austria, Russia and Australia. Mines are worked in India, Japan, Mexico, South America, South Africa, China and the Philippines. Pennsylvania, Ohio, West Virginia, Alabama, Indiana, Iowa and many other states mine coal in great amount. Pennsylvania produces nearly all of the anthracite and a large quantity of bituminous coal.

Bituminous coal, coking coal, non-coking coal, cannel coal, cherry coal, splint coal, gas coal, steam coal, etc., are all varieties of soft coal and contain a considerable percentage of volatile matter.

Bituminous coal is the fuel which runs the factories, railways and steamships of the world. The distillation of coal tar and the utilization of its numerous by-products, is one of the best examples of modern economy which turns waste material into useful products and large profits. Much coke is made without saving the by-products.

By distillation, bituminous coal yields gas, ammonia, coal tar and coke. Coal tar products are numbered by the thousand. Among them are naphtha, benzine, oil of mirbane, perfumes, flavors, drugs, saccharine, aniline and other dyes, phenol, carbolic acid, salicylic acid, napthaline, photographic developers, creosote, oils, tar and pitch.

Anthracite coal is almost pure carbon.

Cobalt is a metal the ores of which are sparingly distributed. It generally occurs as Speiss-cobalt, cobalt-glance (or cobaltite), wad, cobalt-bloom, linnæite and skutterudite. Its minerals are found chiefly in the Erzgebirge Mountains, Sweden, Norway, Chile, in silver ores near Coleman township, Ontario, in Oregon (as garnierite), and in New Caledonia. The metal itself is of a gray color with a reddish tinge, brittle, hard, and very magnetic.

Many of its compounds are valued on account of the brilliance and permanence of their colors. The protoxide of cobalt, is employed in the form of smalt in the production of the blue colors in porcelain, pottery, glass, encaustic tiles, fresco-painting, etc., and forms the principal ingredient in Old Sevres Blue, Thenard's Blue, etc. The chlorid of cobalt, dissolved in much water, may be employed as a sympathetic ink. In dilute solutions, it is of a faint pink color, which is not observable upon paper; but when heated before the fire, it loses water, and becomes blue, and the writing is then capable of being read.

Copper is, next to iron, the most important metal in use. Its greatest production is in the United States, in Arizona, Montana, Michigan, and Utah. Spain, Japan, Chili, Australia and Germany produce smaller amounts. The metal is purified by smelting, and refined, often by electrolytic methods. There are many ores.

Chalcopyrite and *bornite* (sulphides of copper and iron) are widely distributed.

Chalcocite (copper sulphide) is mined in Montana, *malachite* and *azurite* (carbonates of copper) in Arizona and metallic copper in Michigan.

Copper matte is the crude metal as it comes from the smelter.

Brass and bronze are alloys of copper with zinc, tin, aluminum, etc.

Copper sulphate (blue vitriol) is the most important chemical compound of copper.

The value of copper has increased within recent years, due to its enormous use in electrical work. Aside from this, copper is employed in large amount in the various alloys into which it enters, and in coins, utensils, printing plates, etc. Copper sulphate is extensively used in electrical apparatus dyes, chemical work and as an antiseptic. Large amounts of manufactured copper are exported to Europe. Smaller quantities of ores, matte and regulus are imported from Mexico, South America and other countries. Copper wire is extensively used by telephone and telegraph companies.

Diamond. See gems.

Gems, or Precious Stones are those which, because of their beauty, hardness, and rarity, are prized for use in ornamentation, especially

in jewelry. The diamond, ruby, sapphire, and emerald are the only stones which are, strictly speaking, entitled to be called "precious" in this sense; but the opal, on account of its beauty, is often classed with the precious stones; as is also the pearl, which is really not a stone, but a secretion of a shellfish.

Alexandrite.—A variety of chrysoberyl found in the mica slate of the Ural mountains. It is of a rich garnet color by artificial light, by daylight of a dark moss green. It is the only stone that so changes. The finest specimens of alexandrite are nearly as valuable as diamonds.

Amethyst.—A variety of crystallized quartz of a purple or bluish-violet color, of different shades. It is much used as a jeweler's stone. The lighter colored ones come from Brazil, the deep purple ones from Siberia. In value they are about the same as the garnet.

Beryl.—A very hard mineral of much beauty when transparent. It occurs in hexagonal prisms, commonly of a green or bluish-green color, but also yellow, pink and white. It is a silicate of aluminum and glucinum. Beryls are very rich in colors.

Bloodstone.—A green siliceous stone sprinkled with red jasper, whence the name.

Cameo.—A figure cut in stone or shell that is composed of different colored layers. The value depends on the artistic merit of the engraved figure.

Carbuncle.—A beautiful gem of a deep red color (with a mixture of scarlet), found in the East Indies. When held up to the sun it loses its deep tinge, and becomes of the color of a burning coal.

Carnelian.—A variety of chalcedony, of a clear, deep red, flesh-red, or reddish-white color. It is moderately hard, capable of a good polish, and often used for seals. It is now used but little.

Cat's-eye.—A variety of quartz or chalcedony exhibiting opalescent reflections from within, like the eye of a cat. The name is given to other gems affording like effects, especially the chrysoberyl.

Chalcedony.—A translucent variety of quartz, having usually a whitish color, and a luster nearly like wax.

Dendrite.—A stone or mineral in which are branching figure, resembling shrubs or trees, produced by a foreign mineral, usually by an oxide of manganese, and the moss agate.

Diamond.—A precious stone or gem excelling in brilliancy, beauty of prismatic colors, and remarkable for extreme hardness. It is found in many hues—green, rose, straw, yellow, etc.—but the straw-colored ones are the most common. The diamond is a native carbon, occurring in isometric crystals, often octahedrons, with rounded edges. It is the hardest substance known. Diamonds are said to be of the first water when very transparent, and of the second and third water as the transparency decreases.

Diopside.—A crystallized variety of pyroxene (a silicate of lime and magnesia), of a clear, grayish-green color; also called mussite.

Emerald.—A precious stone of a rich green color; it is the most valuable variety of beryl. (See beryl.)

Epidote.—A mineral, commonly of a yellowish-green color, occurring granular, massive, columnar, and in crystals. It is a silicate of alumina, lime, and oxide of iron, or manganese.

Fluorite.—Calcium fluoride, a mineral of many different colors, white, yellow, purple, red, etc., often very beautiful. When crystallized it is commonly in cubes with perfect octahedral cleavage. Some varieties are used for ornamental vessels. Also called fluor spar, or simply fluor. The colored varieties are often called false ruby, false emerald, false topaz, false sapphire, and false amethyst.

Flint.—A massive, somewhat impure variety of quartz, in color usually of a gray to brown or nearly black. (See quartz).

Garnet.—A mineral having many varieties, differing in color and in their constituents, but with the same general chemical formula. The commonest color is red; the luster is vitreous, or glassy; and the hardness is greater than that of quartz, about half as hard as the diamond. Besides the red varieties there are also white, green, yellow, brown and black ones.

The garnet is a silicate with various bases. The transparent red varieties are used as gems. The garnet was the carbuncle of the ancients. Garnet is a very common mineral in gneiss and mica slate.

The finest specimens of red garnets come from Arizona and a single carat stone is worth about two dollars. A green variety that comes from Russia is worth about half as much as the diamond.

Heliotrope or *bloodstone.*—A green siliceous stone sprinkled with jasper, as if with blood, whence the name.

Hyacinth.—A red variety of zircon, sometimes used as a gem. It resembles closely a dark Spanish topaz, and is worth a little more than the garnet.

Indicolite.—A variety of tourmaline of an indigo-blue color.

Iolite.—A silicate of alumina, iron, and magnesia, having a bright blue color and a vitreous or glassy luster. It is remarkable for its dichroism, and is also called dichroite.

Jacinth.—Same as hyacinth.

Jade.—A stone commonly of a pale to dark green color, but sometimes whitish. It is hard and very tough, capable of a fine polish, and is used for ornamental purposes and for implements. especially in eastern countries and among many primitive peoples.

Jasper.—An opaque, impure variety of quartz, of red, yellow, and other dull colors, breaking with a smooth surface. (See quartz.)

Labradorite.—A kind of feldspar, commonly showing a beautiful play of bluish-gray colors, and, hence, much used for ornamental purposes. The finest specimens come from Labrador.

Lapis-lazuli or *lazuli.*—A mineral of a fine azure-blue color, usually occurring in small rounded masses. It is essentially a silicate of alumina, lime, and soda, with some sodium sulphide. It is often marked by yellow spots or veins of sulphide of iron, and is much valued for ornamental work.

Moonstone.—A nearly pellucid variety of feldspar, showing pearly or opaline reflections from within.

The best specimens come from Ceylon. Their value is not much more than the expense of cutting.

Obsidian.—A kind of glass produced by volcanoes. It is usually of a black color and opaque, except in thin splinters.

Onyx.—Chalcedony in parallel layers of different shades of color. It is used for making cameos, the figure being cut in one layer with the next layer as a background (see cameo). It is stained black and used to make mourning jewelry.

Opal.—A mineral consisting, like quartz, of silica, but inferior to quartz in hardness and specific gravity. The precious opal shows a peculiar play of colors of delicate tints and it is highly esteemed as a gem. One kind, with a varied play of colors in a reddish ground, is called harlequin opal. The fire opal (which comes from Mexico) has colors like the red and yellow of flame. This is not the cheap variety commonly called Mexican opal.

Pearl.—A shelly concretion, usually rounded, having a brilliant luster, with varying tints, formed in the mantle, or between the mantle and shell, of certain bivalve mollusks (especially in

CELEBRATED HISTORIC DIAMONDS OF THE WORLD

Name and Possessor	Carats (Cut)	Carats (Uncut)	Discovered
1. Great Mogul ..... Indian Moguls	280	.....	17th Cent.
2-11. Pitt or Regent ..... King of Prussia	136⅞	410	1702
3-5. Florentine ..... Emperor of Austria	139½	.....	.....
4-12. Star of the South ..... Brazilian Government	127	254	1853
6. Sancy ..... Russia	53½	83	15th Cent.

Name and Possessor	Carats (Cut)	Carats (Uncut)	Discovered
7. Green Diamond ..... Dresden Museum	40	.....	.....
8-10. Koh-i-noor ..... Crown of England	280 (Old) 106 ⅝ (New)	.....	B. C. 56
9. Hope ..... Mrs. E. B. McLean, Washington, D. C.	44½	.....	.....

OTHER NOTED DIAMONDS

Cullinan I Cullinan II ..... Crown of England	516½ 309¾	3,025¾	1905
Braganza ..... Portugal	Never Cut	1,680	1741
Rajah of Mattan ..... Rajah of Mattan (Borneo)	367.9	787½	1756
Orloff ..... Russia (scepter)	194¾	.....	.....
Tavernier ..... Stolen in 1792	.....	242½	1668
King of Portugal	138½	150	1775
Light Yellow ..... Stewart (diamond)	.....	288⅝	.....
Shah ..... Russia	86	.....	.....
Nassac ..... Lord (Marquis of) Westminster	78⅝	89⅝	.....
Porter Rhodes ..... Found in South America	.....	150	1872
Blue	67½	112	.....
Pigott ..... Bought by Messrs. Rundell and Bridge	49	.....	.....
Dudley ..... Earl of Dudley	49½	88½	.....
Star of South Africa	46½	83½	1867
Pasha of Egypt ..... Khedive of Egypt	40	.....	.....
Charles the Bold	28	.....	.....

the pearl oysters and river mussels) and sometimes in certain univalves. Its substance is the same as nacre or mother-of-pearl. Pearls which are round, or nearly round, and of fine luster, are highly prized as jewels. They are sold by carat grains instead of carats.

Rhodonite.—Manganese spar, or silicate of manganese, a mineral occurring crystallized and in rose-red masses. It is almost entirely used for ornamental purposes, in slabs, blocks, etc.

Rock crystal or *mountain crystal.*—Any transparent crystal of quartz, particularly of limpid or colorless quartz. A sphere of rock crystal of absolutely perfect clearness, about five inches in diameter, is worth at least twenty thousand dollars.

Rose quartz.—A variety of quartz which is pinkish red.

Rubellite.—A variety of tourmaline varying in color from a pale rose-red to a deep ruby, and containing lithium. It is a little more valuable than the garnet.

Ruby.—A precious stone of a carmine-red color, sometimes verging to violet, or intermediate between carmine and hyacinth red. It is a crystallized variety of corundum. The ruby from Siam is of a dark color and is called oxblood ruby. It has about the same value as the diamond. The ruby from Burmah, called the pigeon-blood ruby, is of a lighter color and several times more valuable than the oxblood ruby.

Sapphire.—A variety of native corundum or aluminium sesquioxide. As the name of a gem the term is restricted to the transparent varieties of blue, pink, yellow, and other colors. The best specimens of the blue variety are nearly as valuable as the diamond. The sapphire is next to the diamond in hardness.

Sard.—A variety of carnelian, of a reddish-yellow or brownish color.

Sardonyx.—A variety of onyx consisting of sard and white chalcedony in alternate layers. (See onyx.)

Spinel.—A mineral occurring in octahedrons of great hardness and various colors, as red, green, blue, brown, and black, the red variety being the gem spinel ruby. It consists essentially of aluminum magnesium, but commonly contains iron and sometimes also chromium. The fine specimens of spinel ruby are worth rather more than half as much as the diamond.

Topaz.—A mineral occurring in rhombic prisms, generally yellowish and pellucid, also colorless, and of greenish, bluish, or brownish shades. It sometimes occurs massive and opaque.

Tourmaline.—A mineral occurring in three-sided prisms. Black tourmaline is the most common variety, but there are also other varieties, as the blue (indicolite, red (rubellite); also green, brown, and white. The red and green varieties, when transparent, are valued as jewels. The finest ones come from Maine, and are worth four or five times as much as garnets.

Turquoise.—A hydrous phosphate of alumina containing a little copper. It has a blue, or bluish-green color, and usually occurs in kidney-shaped masses with a nodular surface like that of a bunch of grapes. The finest specimens are worth nearly half as much as diamonds.

Verd antique.—A mottled-green, serpentine marble, also a green porphyry, which is called oriental verd antique.

Zircon.—A mineral usually of a brown or gray color. It consists of silicon and zirconium, and is harder than the garnet. The transparent varieties are used as gems. The red variety is called Hyacinth; a colorless, pale yellow, or smoky-brown variety from Ceylon is called jargon.

Gold, a metal valued on account of its scarcity, color, luster, and power of resisting oxidation. It is found in nearly all parts of the world. South Africa and the United States are the leading producers. Australia, South America and parts of Europe possess important gold fields.

Gold is separated from gravel (placer mines) by washing with water. The particles of metal, being heavy, sink and can be collected. Rock containing gold is crushed to fine powder and the gold combined with mercury (amalgamation). Low-grade ores are treated with a solution of cyanide of potassium which dissolves the gold and the metal is later separated.

Chloride of gold, used in photographic work, is its only important compound. Pure gold is called twenty-four carats fine. A smaller figure indicates that the metal is alloyed to harden it.

Gold is used for money, jewelry, gold leaf (gilding) and in dentistry. It is almost always alloyed with copper and silver. Gold is the world's accepted standard of value. Shipments of gold go from one country to another chiefly to balance international business dealings. Government treasuries and bank vaults

are the chief storehouses for gold, either as bullion or coin.

Graphite is almost pure carbon. It is produced in Bohemia, Ceylon, Italy, Germany, Mexico and the United States. The deposits in Ceylon are the largest in the world. Much of that mined in New York and Alabama is of very high grade.

Plumbago or *black lead* is used in making crucibles, lead pencils, lubricants for heavy machinery, stove polish, foundry facings, paint, etc.

Artificial graphite is made from coal or coke by an electric process.

Powdered graphite is mixed with fine clay in greater or less proportion and then molded and baked to form such articles as crucibles and lead for pencils. Graphite is imported from Ceylon to the United States, and lead pencils from Europe.

Iron is the most useful of all metals. The United States, Germany, Great Britain, Spain and France are the greatest producers of iron. Its ores occur in almost all parts of the world. Hematite is mined in Minnesota, Michigan, Alabama and other parts of the United States and in Germany, England, France, Spain, Russia, etc. Limonite is also widely distributed. Pig iron is made by smelting iron ore in a blast furnace. The ore, mixed with limestone, is melted by burning coke, coal or charcoal.

Pyrite (iron pyrites, or fool's gold) is found in Spain and many other parts of the world and is valuable in the preparation of sulphuric acid (oil of vitriol), but useless as an iron ore.

Hematite (sesquioxide of iron) is the ore which supplies three-fourths of the iron of commerce.

Limonite brown (hematite) is a hydrous oxide and furnishes nearly one-fourth of the world's supply of the metal. Magnetite and siderite are less common ores.

Pig iron is the crude form of the refined metal and is transformed into cast iron, wrought iron and steel in their multitudinous forms.

These three forms of iron differ in hardness, strength, elasticity, malleability, etc., according to the amounts of carbon, sulphur, phosphorus, manganese and other elements.

Ochers and metallic paints are iron oxides. *Prussian blue* and *copperas* are iron compounds.

The United States manufactures more iron and steel than any other country. Almost half of the production is in Pennsylvania. *Cast iron* appears in many articles but is weaker than other forms of iron. *Wrought iron* contains less impurity and is used for bars, plates, wire, structural material and parts of machinery. *Steel* (Bessemer, Siemens-Martin, open hearth, etc.) contains more carbon than wrought iron, possesses both strength and hardness, and is used for rails, structural material, machinery, tools, wire rope, sheet steel, etc. Its hardness may be increased by tempering. The United States imports iron ore from Cuba and Spain, pig iron from Great Britain and a little manufactured iron and steel from Europe. We export large quantities of manufactured iron and steel.

Lanthanum. See rare metals.

Lead is the softest, heaviest, most malleable and most easily melted of the common metals. Its ores are found in many countries but the main supply is from the United States, Spain, Germany and Mexico. The chief lead mines of the United States are in Missouri, Idaho, Utah, Colorado and Kansas. Much lead bullion is from smelters where silver ores are reduced.

Galena (lead sulphide) is the only important ore; it often carries a considerable percentage of silver. Carbonates and sulphates of lead are less common. *Solder* and *type metal* are alloys of lead with tin and antimony. *White lead* is a carbonate, *red lead* and *litharge* are oxides. *Chrome yellow* and *orange mineral* are lead compounds used as pigments.

The chief use of metallic lead is in piping, sheet lead, shot and alloys. Large amounts of ore are transformed not into metallic lead but into white lead for use in paints. Lead ores and lead bullion are imported from Mexico. England is the greatest importer of lead and lead ores.

Lithium is the metallic base of the Alkali lithia. The metal is of a white, silvery appearance, and is much harder than sodium or potassium, but softer than lead. It is the lightest of all known solids, its specific gravity being little more than half that of water. It comes principally from South Dakota, California and Sweden.

In chemical laboratories it is converted into lithium carbonate for medicinal tablets and mineral waters.

Magnesium is a metal widely distributed over the globe, and chiefly mined in Austria, Germany and Greece. The metal is used in flash powders for photographic use, and in chemical manufacture, in fireproofing and lining furnaces.

Magnesite (magnesium carbonate) is used in making carbon dioxide gas and epsom salts and for preparing magnesia (calcined magnesia).

Dolomite (magnesium calcium carbonate) is common limestone, used for building. Found in many parts of the world. Calcined dolomite is used for lining iron furnaces.

Talc (hydrous magnesium silicate), soapstone or steatite, is a soft mineral. Mined in Maryland, Virginia, North Carolina, etc., and in Europe. It is made into laundry tubs, firebrick, hearthstones, griddles, slate and tailor's pencils, gas tips, etc. Imported in small amount from France and Italy.

Meerschaum or sepiolite (magnesium silicate), comes from Asia Minor and New Mexico. It is easily carved and made into pipes and cigar holders. Austria and France use large quantities. It is largely imitated.

Asbestos is a fibrous variety of serpentine (a magnesium silicate). Mineral wool is an artificial fibrous mineral. It is mined in Quebec, Canada. Another variety of asbestos comes from Italy. Mines have been recently discovered in Wyoming. It is used as a fireproofing material. This mineral fiber is spun and woven into fireproof fabrics for theater curtains or made into felt building paper, pipe covering, etc.

Mercury (or quicksilver) is a heavy metal which is liquid at ordinary temperatures. It is produced in Spain, the United States,

Austria, Italy and Russia. California supplies most of this country's quota. It is obtained by distillation of the ore.

Cinnabar (sulphide of mercury) is the source of the metal, although a little is found in nature in the pure state.

Vermilion (artificially prepared cinnabar) is used in paints.

Calomel and *corrosive sublimate* are used in medicine and *fulminates* of mercury in explosives.

It is used principally in the extraction of gold and silver from their ores by amalgamation. Employed in thermometers and barometers, silvering mirrors, and in making amalgams for dental work.

Mica is a common mineral found in rocks in many parts of the world. It is mined in India, Canada, North Carolina and South Dakota. Several varieties occur (muscovite, biotite, etc.)—valuable only when found in large sheets which can be split smoothly. Transparent sheets are used for lamp chimneys and stove doors. It is also employed in electrical work, and lubricating. Some is imported from India.

Molybdenum. See rare metals.

Nickel is found in the ores pyrrhotite and garnierites, mined in largest amount in New Caledonia and Canada. Norway produces other ores.

Garnierite (a silicate of nickel and magnesium) is the common ore. Magnetic iron pyrite (*pyrrhotite*) often carries several per cent of nickel. Sulphides and other compounds occur. *German silver* contains nickel, copper and zinc. It enters into other alloys.

France and Germany refine nickel from imported ore, chiefly from New Caledonia. Nickel steel, being especially hard and tough is used for armor plate, special machinery and wire rope. Nickel is extensively used for cheap electro plating.

Nickel and nickel oxide are exported to Holland and England from the United States and ores and matte are imported from Canada.

Petroleum (or coal oil) is obtained from wells in the United States, Russia, Dutch East Indies, Galicia, Roumania and other countries. More than half of the world's output is from the United States, the leading districts being (1) Kansas and Oklahoma, (2) California, (3) Illinois, (4) Pennsylvania and (5) Texas. Crude oil is transported from the wells for hundreds of miles through pipe lines to the refineries.

In its crude state, petroleum is a dark colored liquid. It yields by distillation, first: light oils, *gasoline*, *naphtha*, *benzine*; second: *illuminating oils*, *kerosene*, *headlight oil*, etc.; third: *lubricating oils*, *engine oil*, *cylinder oil*, *machine oil;* fourth: *petroleum residuum* (for asphalt paving) and *coke*. *Petrolatum*, *vaseline* and *paraffin wax* are by-products in petroleum refining.

American kerosene oil is exported to all parts of the globe. Crude oil is also exported as well as other petroleum products.

Platinum is a rare metal found with gold, iridium and other rare metals in placer mines. It comes chiefly from Russia. Smaller amounts from Colombia, California, Canada and Australia.

It is used in the terminals of incandescent electric lamps, and also employed by chemists, jewelers and dentists.

Potash (or potassium) is an alkaline metal. Chlorides, sulphates, etc., are found in Germany. Wood ashes and sugar beet refuse furnish much of the world's potash. Stassfurt, Germany, possesses the only known large deposit of natural potash salts. These salts are the source of potash in many chemical industries and in fertilizers. It is exported in large amount from Germany to England, France and America.

Quartz (silica) is of many varieties, crystalline to amorphous.

Rock flint is mined in Connecticut and Pennsylvania, and also comes from the chalk cliffs of England and France.

Sandstones are quarried and used for building in almost all parts of the world. Pennsylvania, Ohio, and New York supply the greatest quantities in the United States. *Honestones* and *whetstones* are mostly sandstone, and in this country are largely quarried in Arkansas, Michigan and New Hampshire.

Rock crystal is employed for lenses. Many semi-precious stones are varieties of quartz, as *agate*, *moss agate*, *onyx*, *sard*, *chalcedony*, *chrysoprase*, *jasper*, etc.

Rock flint and *quartz sand* are used in making glass and pottery.

Outside of building stones, quartz is used in greatest amount in making glass and pottery. For glass it is melted with alkali (soda ash) and either lime or lead oxide. Glass is either blown or molded. Belgium, Austria, Germany, France, Great Britain and the United States manufacture glassware. Pennsylvania, Indiana and New Jersey are the leading states.

Radium is the most characteristic of those substances which possess the property of radio-activity—i. e. have the power of producing photographic or electric effects by a process identical with or analogous to radiation. The property was first observed in *uranium* by Becquerel in 1896—hence the name "Becquerel rays." In 1898 Schmidt and Madame Curie discovered almost simultaneously that the compounds of *thorium* had the same radio-active property; and further elaborate investigations led to the discovery of *polonium*, *radium*, and *actinium*, as new substances with radio-active properties. Polonium was the name given by M. and Mme. Curie to the radio-active component of bismuth separated from pitchblende. Its activity is transient. In the new field of research thus opened up important work has been done by Rutherford, Crooks, Ramsay, Soddy, Huggins, and others.

Radium is derived from *pitchblende*, in which it exists in very small quantities. After a long-continued process of fractional crystallization it has been prepared in the form of a tolerably pure salt. The process of obtaining the element is very tedious. One to two kilograms of impure radium bromide can be procured from a ton of pitchblende residue only after processes extending over months. For the remarkable chemical properties of radium, see further under Radio-activity.

Rare Metals. These include chiefly the following: *Tungsten, molybdenum, vanadium* and *uranium.* They are found in Colorado, Arizona, Germany, England and Sweden. The ores of these metals are unusual minerals, and the metals themselves are used in making special high grades of steel. Their salts are used in dyeing.

Thorium, cerium, lanthanum and *yttrium,* found in North Carolina, Norway, Brazil and Ceylon, are also to be classified under this head. Monazite, samarskite, thorite and other rare minerals contain these elements. They are used in preparing the mantles for incandescent gas lights.

Silver the more common precious metal, is produced in greatest amount in the Rocky Mountains and the Andes. The United States, Mexico, Australia, Bolivia, Chili, Peru and Germany contribute nearly the entire supply. Montana, Colorado, Nevada and Utah lead in silver production in the United States. The ores are usually smelted and refined to purify the metal.

Argentiferous galena (lead ore) is the commonest ore of silver. The amount of silver per ton varies greatly. Zinc and copper ores often carry silver. Many sulphides of silver (argentite, pyrargyrite, etc.) are found, as well as chlorides and bromides (cerargyrite and bromyrite). *Chloride* and *nitrate of silver* are used in photography.

Silver is manufactured into innumerable articles for household use and personal adornment. The cheapest articles are not solid (sterling) but are electrically plated with a very thin coating of silver. Silver coins form the bulk of the currency of the world, although in most countries gold is the standard.

Sodium is the most important alkaline metal, and has a wide use.

Salt (rock salt, sea salt, lake salt, halite or sodium chloride) is the commonest natural compound of sodium. Important for food and in chemical manufacture.

Rock salt is mined in Germany, Austria, Spain, England, Louisiana, Kansas, India and other parts of the world. Obtained by evaporating salt water from wells in England, Michigan, New York, Ohio and China, or by evaporating salt water in the West Indies, Great Salt Lake, etc.

Besides its use for meat packing, curing fish, domestic purposes, etc., it is employed in silver refining, and the preparation of hydrochloric acid, soda ash, carbonate of soda and other chemical products.

Soda niter (nitrate of sodium) is a very easily soluble mineral. It is found in quantity only in the deserts of northern Chili, and is exported in large amounts to Europe and America for fertilizer and the manufacture of nitric acid and other chemicals.

Borax (hydrous sodium borate) occurs in nature in an impure form and is prepared also from calcium borates. Borates are found in Tuscany, Central Asia, California and Nevada, and in South America.

Borax and boracic acid are used in pottery manufacture, for the preservation of meat, in dyeing and in medicine.

Strontium is found in Germany, Scotland, Texas and New York. Strontianite (strontium carbonate) and celestite (strontium sulphate) contain this element. Strontium salts are used in sugar refining and making red fire.

Sulphur or brimstone is found in a pure state in volcanic regions or associated with gypsum and limestone. Pyrite (sulphide of iron) is also a source of sulphur compounds.

Sicily, Italy, Japan, Louisiana and Utah have mines of native sulphur, which is used in manufacturing sulphuric acid, gunpowder, matches, as a disinfectant, for bleaching and vulcanizing rubber.

Blue vitriol, green vitriol and alum are sulphates. Sulphur is imported from Sicily and Italy.

Thorium. See rare metals.

Tin is less abundant than most of the common metals. The Malay peninsula and nearby islands (Banca and Billiton) produce over half the tin ore of the world. The remainder is mined in Bolivia, Australia, Tasmania and Cornwall, England. Small deposits occur in the United States.

Tin melts at a low temperature and is easily refined.

Cassiterite (tin oxide) is the only important ore. This mineral is commonly found as pebbles (stream tin) in gravel.

Tinplate and alloys containing tin are of enormous importance in the arts. Of these, *bronze* is chief. *Gun metal, pewter, solder, type metal* and *britannia metal* are other alloys. Salts of tin are used in dyeing, glass making, etc.

Tinplate, used for tin cans, roofing and kitchen utensils, is made by dipping sheet iron or steel in a bath of melted tin, thus covering it with a thin layer of tin. Tinplate is manufactured in the United States and imported from England. Tin metal is imported from England and Straits Settlements.

Tungsten. See rare metals.

Uranium. See rare metals.

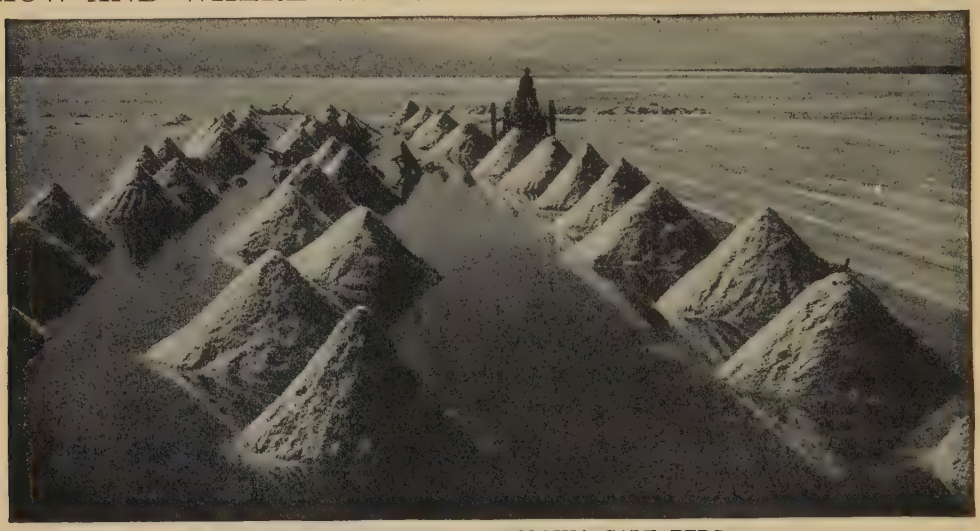
Vanadium. See rare metals.

Zinc is one of the most useful metals. Germany, United States and Belgium supply most of the zinc. In this country, Missouri and Kansas lead in zinc production.

Sphalerite or blend (zinc sulphide) is the chief ore. Carbonates, silicates and oxides of zinc are found. Crude zinc (*spelter*) is distilled from roasted ore.

Brass, German silver and other alloys contain zinc. *Galvanized iron* consists of a coating of zinc on sheet iron. *Zinc oxide* (zinc white) resembles white lead and is used in paints.

Used in electric batteries, making hydrogen, zinc etchings, etc. The greatest amount of zinc is used in alloys and zinc compounds. Zinc and zinc ores are both imported and exported by the United States, the imports exceeding the exports. Zinc oxide is exported in larger amount than any other form.



THE PRODUCTIVE CALIFORNIA SALT BEDS

The United States produces one-fourth of the entire output of the world. Salt was one of the first two great articles of international commerce in the history of the world trade.

AN UNDERGROUND PASSAGE WAY THROUGH SOLID SALT

The most wonderful salt mines in the world are those of Galicia, in Austria. In this region there is a mass of salt estimated to measure 500 miles in length, 20 miles in breadth, and 1,200 feet in thickness.

SCIENTIFIC TERMS USED IN THE EARTH SCIENCES

Acanthodus (*a-kan-thō'dus*).—Fossil fish, having thorn-like fins.

Aërodynamics (*ā-ĕr-ō-di-nam'iks*).—The science which treats of the air and other gaseous bodies under the action of force, and of their mechanical effects.

Aërognosy (*ā-ĕr-ŏg'nō-sĭ̆*).—The science which treats of the properties of the air, and of the part it plays in nature.

Aërolite (*ā'ĕr-ō-līt*).—A stone, or metallic mass, which has fallen to the earth from distant space; a meteorite; a meteoric stone.

Aërology (*ā-ĕr-ŏl'ŏjĭ̆*).—That department of physics which treats of the atmosphere.

Aerometer (*ā'ĕr-ŏm'ē-tĕr*).—An instrument for ascertaining the weight or density of air and gases.

Ammonites (*am'mo-nīts*).—Fossil mollusks of spiral form, found in all strata from the palæozoic to the chalk; very numerous, varying greatly in size; all now extinct; sometimes called snake-stones.

Anemology (*ăn-ĕ-mŏl'ŏ-jĭ̆*).—The science of the wind.

Anemometer (*ăn-ĕ-mŏm'ĕ-tĕr*).—An instrument for measuring the force and velocity of the wind; a wind gauge.

Attrition (*ăt-trĭsh'ŭn*).—The act of rubbing together; friction; the act of wearing by friction, or by rubbing substances together; abrasion.

Aurora (*aw-rō'rȧ*).—The rising light of the morning; the dawn of day; the redness of the sky just before the sun rises.

Aurora Borealis (*bō'rē-ā'lĭs*), i. e., northern daybreak; popularly called northern lights. A luminous meteoric phenomenon, visible only at night, and supposed to be of electrical origin. This species of light usually appears in streams, ascending toward the zenith from a dusky line or bank, a few degrees above the northern horizon. Occasionally the aurora appears as an arch of light across the heavens from east to west. Sometimes it assumes a wavy appearance. They assume a variety of colors, from a pale red or yellow to a deep red or blood color

The **Aurora Australis** (*aws-trā'lĭs*) is a corresponding phenomenon in the southern hemisphere the streams of light ascending in the same manner from near the southern horizon.

Barometer (*bȧ-rŏm'ē-tĕr*).—An instrument for determining the weight or pressure of the atmosphere, and hence for judging of the probable changes of weather, or for ascertaining the height of any ascent.

Calamites (*kal'a-mīts* or *kal'a-mī'tēz*).—Reed-like plants, found in coal.

Carboniferous (*kär'bŏn-ĭf'ĕr-ŭs*).—Producing or containing carbon or coal.

Conglomerate (*kŏn-glŏm'ĕr-ȧt*).—Pudding stone, composed of gravel and pebbles cemented together.

Corona (*kō-rō'nȧ*).—A circle, usually colored, seen in peculiar states of the atmosphere around and close to a luminous body as the sun or moon.

Cosmogony (*kŏs-mŏg'o-nĭ̆*).—The creation of the world or universe; a theory or account of such creation.

Cosmology (*kŏz-mŏl'ŏ-jĭ̆*).—The science of the world or universe; or a treatise relating to the structure and parts of the system of creation, the elements of bodies, the modifications of material things, the laws of motion, and the order and course of nature.

Crystallography (*krĭs'tal-lŏg'rȧ-fĭ̆*).—The science of crystallization, teaching the system of forms among crystals, their structure, and their methods of formation.

Cyclone (*sī'klōn*).—A violent storm, often of vast extent, characterized by high winds rotating about a calm center of low atmospheric pressure. This center moves onward, often with a velocity of twenty or thirty miles an hour.

Denudation (*dĕn'ū-dā'shŭn* or *dē'nū-*).—The laying bare of rocks by the washing away of the overlying earth, etc.; or the excavation and removal of them by the action of running water.

Deposit.—A body of ore distinct from a ledge; pocket of gravel or pay dirt.

Diplacanthus (*dip-lȧ-kăn'thus*).—A fish, belonging to Acanthodii, known only by fossil remains in Old Red Sandstone.

Drifts.—Tunnels leading off from the main shaft, or from other tunnels or levels, through and along the vein.

Drift Matter.—Earth, pebbles and bowlders that have been drifted by water, and deposited over a country while submerged.

Druse (*drus*).—A cavity in a rock, having its interior surface studded with crystals and sometimes filled with water.

Elephas (*el'e-fas*).—The Latin name for Elephant. The primitive elephant was what is known as the Mammoth.

Fata Morgana (*fä'tȧ mŏr-gä'nȧ*).—A kind of mirage by which distant objects appear inverted, distorted, displaced, or multiplied. It is noticed particularly at the Straits of Messina, between Calabria and Sicily, Italy.

Fire-damp.—An explosive carburetted hydrogen of coal mines.

Fissures.—Seams or crevices in rocks formed by volcanic or earthquake action, and when filled subsequently by metal or metallic ores they become fissure veins.

Fog.—Watery vapor condensed in the lower part of the atmosphere and disturbing its transparency. It differs from cloud only in being near the ground, and from mist in not approaching so nearly to fine rain.

Geography (*je-ŏg'rȧ-fĭ̆*).—The science which treats of the world and its inhabitants; a description of the earth, or a portion of the earth, including its structure, features, products, political divisions, and the people by whom it is inhabited.

ASTRONOMICAL, or MATHEMATICAL GEOGRAPHY treats of the earth as a planet, of its shape, its size, its lines of latitude and longitude, its zones and the phenomena due to the earth's diurnal and annual motions.

PHYSICAL GEOGRAPHY or PHYSIOGRAPHY treats of the conformation of the earth's surface, of the distribution of land and water, of minerals, plants, animals, etc., and applies the principles of physics to the explanation of the diversities of climate, productions, etc.

POLITICAL GEOGRAPHY treats of the different countries into which the earth is divided with regard to political and social institutions and conditions.

Geology (*jē-ŏl'o-jĭ̆*).—The science which treats: (a) Of the structure and mineral constitution of the globe; structural geology. (b) Of its history as regards rocks, minerals, rivers, valleys, mountains, climates, life, etc.; historical geology. (c) Of the causes and methods by which its structure, features, changes, and conditions have been produced; dynamical geology.

Goniatites (*gō-nī-a-tī'tēz*).—Fossil remains of Ammonites, many species of which are found in Devonian and Carboniferous Limestone.

Hail (*hāl*).—Frozen rain, or particles of ice precipitated from the clouds, where they are formed by the congelation of vapor. The separate particles are called hailstones.

Harmattan (*här-măt'tan*).—A dry, hot wind, prevailing on the Atlantic coast of Africa, in December, January, and February, blowing from the interior or Sahara. It is usually accompanied by a haze which obscures the sun.

Hoarfrost (*hōr'frŏst*).—The white particles formed by the congelation of dew; white frost.

Hydrography (*hī-drŏg'rà-fy*).—The art of measuring and describing the sea, lakes, rivers, and other waters, with their phenomena.

Hygrometer (*hī-grŏm'ē-tĕr*).—An instrument for measuring the degree of moisture of the atmosphere.

Ignis fatuus (*ĭg'-nĭs făt'ŭŭs*).—A phosphorescent light that appears, in the night, over marshy grounds, supposed to be occasioned by the decomposition of animal or vegetable substances, or by some inflammable gas,—popularly called also Will-with-the-wisp, or Will-o'-the-wisp, and Jack-with-a-lantern, or Jack-o'-lantern.

Ichthyosaurus (*ĭk-thē-ō-saw'rus*).—A large marine reptile, known only by fossil vertebræ and other bones, found in oolite rocks.

Labyrinthodon (*lab-i-rin'thō-don*), or Mastodon. A large animal, belonging to Amphibia, remains of which are found in Upper Trias rocks and strata.

Lepidodendron (*lep-i-dō-den'dron*).—Coal-plants, belonging to the Lycopods, of which very many remains are found in coal.

Lepidosteus (*lep-i-dŏs'te-us*).—Bony-pike fish, the fossil remains of which are found in rocks and earth strata.

Lightning (*līt'nĭng*).—A discharge of atmospheric electricity, accompanied by a vivid flash of light, commonly from one cloud to another, sometimes from a cloud to the earth. The sound produced by the electricity in passing rapidly through the atmosphere constitutes thunder.

Lithology (*li-thŏl'ō-jy*).—The science which treats of rocks, as regards their mineral constitution and classification, and their mode of occurrence in nature.

Lode (*lōd*).—A metallic vein; a longitudinal fissure or chasm filled with ore-bearing matter and having well-defined side walls; lode, lead, vein and ledge are synonymous; a mineral vein in the rock.

Mastodon (*mas'tō-don*).—An extinct elephant-like mammal of America, whose teeth have a nipple-like surface.

Metallurgy (*mĕt'al-ler-jy*).—The art of working metals, comprehending the whole process of separating them from other matters in the ore, smelting, refining and parting them; sometimes, in a narrower sense, only the process of extracting metals from their ores.

Meteorology (*mē-tē-er-ŏl'o-jy*).—The science which treats of the atmosphere and its phenomena, particularly of its variations of heat and moisture, of its winds, storms, etc.

Min'er-al'o-gy (*mĭn-er-ăl'ō-jy*).—The science which treats of minerals, and teaches how to describe, distinguish, and classify them.

Mist (*mĭst*).—Visible watery vapor suspended in the atmosphere, at or near the surface of the earth; fog.

Monsoon (*mŏn-s ōōn'*).—A wind blowing part of the year from one direction, alternating with a wind from the opposite direction—a term applied particularly to periodical winds of the Indian Ocean, which blow from the southwest from the latter part of May to the middle of September, and from the northeast from about the middle of October to the middle of December.

Oceanography (*ō'shan-ŏg'rà-fy*).—A description of the ocean.

Oceanology (*ō'shan-ŏl'ō-jy*).—That branch of science which relates to the ocean.

Oreography (*ō-rē-ŏg'rà-fy*).—The science of mountains; orography.

Palæotherium (*pā-lē-ō-thē'ri-um*).—A tapir-like mammal, having canine teeth, known only by fossil remains found in Tertiary rocks.

Pampero (*pàm-pà'rō*).—A violent wind from the west or southwest, which sweeps over the pampas of South America and the adjacent seas, often doing great damage.

Parhelion (*păr-hēl'yŭn* or *hē'lĭ-ŏn*).—A mock sun appearing in the form of a bright light, sometimes near the sun, and tinged with colors like the rainbow, and sometimes opposite to the sun. The latter is usually called an *anthelion*. Often several mock suns appear at the same time.

Petrology (*pē-trŏl'ō-jy*).—The science which is concerned with the mineralogical and chemical composition of rocks, and with their classification; lithology.

Physiography (*fiz-e-ŏg'rà-fy*).—The science which treats of the earth's exterior physical features, climate, life, etc., and of the physical movements or changes on the earth's surface, as the currents of the atmosphere and ocean, the secular variations in heat, moisture, magnetism, etc.; physical geography.

Plesiosaurus (*plē-zi-ō-saw'rus*). An oolithic reptile with crocodile-like head, known by fossil remains, chiefly vertebræ, found in lias and oolitic rocks, named from its fossil remains being found near those of the ichthyosaurus.

Pneumatics (*nū-măt'ĭks*).—That branch of science which treats of the mechanical properties of air and other elastic fluids, as of their weight, pressure, elasticity, etc.

Pterodactyl (*ter-ō-dak'tĭl*).—Winged lizard: extinct reptile; fossil remains found in Kentish chalk.

Pyroscope (*pĭr'ō-skōp*).—An instrument for measuing the intensity of heat radiating from a fire, or the cooling influence of bodies. It is a differential thermometer, having one bulb coated with gold or silver leaf.

Rainbow.—A bow or arch exhibiting, in concentric bands, the several colors of the spectrum, and formed in the part of the hemisphere opposite to the sun by the refraction and reflection of the sun's rays in drops of falling rain. Besides the ordinary bow, called also primary rainbow, which is formed by two refractions and one reflection, there is also another often seen exterior to it, called the secondary rainbow, concentric with the first, and separated from it by a small interval. It is formed by two refractions and two reflections, is much fainter than the primary bow, and has its colors arranged in the reverse order from those of the latter.

Seismology (*sīs-mŏl'ō-jy*).—The science of earthquakes.

Seismometer (*sīs-mŏm'e-tĕr*).—An instrument for measuring the direction, duration, and force of earthquakes and like concussions.

Simoon (*sĭ-mōōn'*).—A hot, dry, suffocating, dust-laden wind, that blows occasionally in Arabia, Syria, and the neighboring countries, generated by the extreme heat of the parched deserts or sandy plains.

Sirocco (*sĭ-rŏk'kō*).—An oppressive, relaxing wind from the Libyan deserts, chiefly experienced in Italy, Malta, and Sicily.

Sivatherium (*siv-a-thē'ri-um*).—A large four-horned antelope, known by fossil remains found in Pliocene rocks of Hindustan.

Strophomena (*strō-fŏm'ĕ-nà*).—A genus of shell-like animals similar to the nautilus, found in numerous fossil forms in Lower Silurian and the carboniferous strata.

Tornado (*tor-nā'dō*).—A violent whirling wind; specifically a tempest distinguished by a rapid whirling and slow progressive motion, usually accompanied with severe thunder, lightning, and torrents of rain, and commonly of short duration and small breadth; a small cyclone.

Typhoon (*tī-fōōn'*).—A violent whirlwind; specifically, a violent whirlwind occurring in the Chinese seas.

Wind.—Air naturally in motion with any degree of velocity; a current of air.

Zosterites (*zos-ter-ī'tez*).—Sear-wracks: marine plants, resembling sea-weeds, with small naked flowers, found at the bottom of the sea

BOOK OF THE PLANT KINGDOM

REALMS OF LIFE UPON THE EARTH
CHIEF DIVISIONS OF THE PLANT KINGDOM:
(1) Cereals, Grasses and Forage Plants
(2) Kitchen Vegetables
(3) The Fruit Trees
(4) Fruit-bearing Shrubs and Plants
(5) Flowers and Other Ornamental Plants
(6) Wild Flowers and Flowerless Plants
(7) Trees of the Forest
(8) Fiber and Commercial Plants
(9) Poisonous Plants
(10) Some Wonders of Plant Life
BOTANICAL CLASSIFICATION OF PLANTS
SCIENTIFIC TERMS USED IN BOTANY, ILLUSTRATED
WORLD MAP SHOWING DISTRIBUTION OF PLANT LIFE

MAP INDICATING THE DISTRIBUTION OF PLANT LIFE THROUGHOUT THE WORLD

THE PLANT KINGDOM

RELATION AND DISTRIBUTION OF PLANT AND ANIMAL LIFE

ALL life in the world is represented by the *Plant* and *Animal* kingdoms. Plants and animals, unlike minerals, grow from germs, and develop into individuals with definite forms and organs. After a limited existence they die, their species being perpetuated by seed or offspring. The *functions* of plants and animals in nature are, however, entirely unlike. Plants are rooted in the soil; animals are free to move over the land, through the water or air. The plant, moreover, transforms the lifeless, inorganic elements (earth and air) into organic matter and thus prepares food for the animal. In its quiet, steady growth it gathers a store of force which the animal uses up in action. Thus the distribution of vegetation regulates that of animal life. Besides, vegetation clothes the surface of the land with that rich mantle of verdure and flowers which is its greatest ornament.

All living things are termed *organisms,* and the science which takes account of them with special regard to their common characteristics is termed *Biology*, or Life-lore. The classification and life-history of plants are the objects of that part of biology known as *Botany*. That part similarly occupied with the study of animals is known as *Zoology*.

THROUGHOUT the entire realm of nature, in the *animal* world as well as in the *Plant* world, development of life increases in energy, and in the variety and perfection of the types, with the increasing intensity of light and heat, from the poles to the equator.

TROPICAL LIFE

Within the tropics, under the stimulating rays of a vertical Sun, grow the most dense and varied forests, the most expanded foliage, and the largest and the most brilliant flowers. Here, also, are found the most delicious fruits, the most powerful aromatics, the greatest variety of plants capable of affording sustenance to man, and the largest number of those which contribute to the luxuries of civilized life.

In the tropical regions, also, are found the greatest variety of land animals; with the highest types, the greatest stature, the most intense activity, and the keenest intelligence exhibited in the brute creation.

WHERE THE MOST POWERFUL ANIMALS ARE FOUND

This zone is the home of the gigantic elephant and giraffe; of the lion and the tiger, the most powerful of all the beasts of prey; and of the gorilla, chimpanzee, and ourang-outang, of all animals most resembling men.

Here, also, are the ostrich, the largest and most powerful of birds; the condor, surpassing in size all other birds of flight; and the humming-birds of South America, the smallest of the feathered tribes, unsurpassed in brilliancy of coloring, rapidity of motion, and grace of form.

In the same zone are those enormous reptiles, the crocodile and the boa-constrictor, with the hooded snakes and other serpents of most deadly venom; and insects of all sizes in indescribable profusion.

LIFE IN THE TEMPERATE ZONES

In the Warm-Temperate Zone, though the Sun never reaches the zenith, yet during the long summer his rays are almost vertical; while the winter is so mild that snow and ice are of rare occurrence.

Here the vegetable world is less prodigal in species, and less luxuriant in growth, than in the tropical regions; still, verdure is continuous throughout the year, and fruits and flowers succeed each other almost without interruption.

The animal world shows a similar, though less marked, decrease in the exuberance of life. The higher orders are less numerous, the individuals less gigantic and powerful; yet the antelopes, among the most graceful of animals, and the camel, one of the most useful, especially characterize this zone.

HOW THE LIFE OF THE TEMPERATE ZONE DIFFERS FROM THAT OF WARMER ZONES

In the Temperate Zone, farther from the tropics, and receiving the Sun's rays with greater obliquity, all the forms of vegetable growth are more modest than in the preceding. The forests are less dense and varied, the foliage is less luxuriant, and flowers of brilliant hues

are confined to shrubs and herbaceous plants.

Though useful plants are numerous, yet scarce a species is of value in its spontaneous growth; and, above all, the long dormant season, when the trees and shrubs are bare and apparently lifeless, stamps the vegetation of this zone with an aspect of inferiority.

The animal world still shows a large number of noble species; yet there are some orders which, like the plants, are dormant during the winter; while many of the birds migrate to warmer climes. Associated with deciduous forests, boundless fertile prairies, and arid steppes —are the bear, the wolf, the lynx, the bison, and many species of elk and deer.

ORIGINAL HOME OF OUR DOMESTIC ANIMALS

Here is the home of the horse, the ass, and many varieties of oxen, sheep, and goats,—those animals which, domesticated by man, have accompanied him to all climes, adapting themselves to all circumstances. The American turkey, the European pheasant, and the Asiatic parents of many of our domestic fowls, also belong to the temperate zone; together with a multitude of song birds, whose sober plumage, contrasting so gloomily with the brilliant colors of their neighbors of the tropics, is compensated by the sweetness of their notes. Here, also, is the home of the honey-bee, and of the silk-worm, almost the only insects directly useful to man.

LIFE IN THE COLD ZONES

In these regions, where the sun is always low, and in winter is above the horizon but a small part of the time, all nature becomes increasingly monotonous. The conifers, with their stiff forms and sombre hues, impart a dreary aspect even to the summer landscape; and, during the long winter, all life seems suspended.

The animal world, however, is more rich and varied than the vegetable.

Here we meet the great moose and the brown bear, the beaver and other rodents, in large numbers; the sable, the mink, the ermine, and a host of other animals whose fine, soft furs form one of the main resources of this inhospitable clime.

In the Arctic Zone—where the forests give place to dwarf trees, stunted or creeping shrubs, mosses, and lichens—the reindeer, the musk-ox, and the white bear are the only representatives of the larger land animals, though the smaller furry tribes are still numerous.

The sea, however, more genial in its temperature than the land, swarms with living creatures of innumerable species, among which are the largest representatives of the animal kindgom. The whale, the walrus, and the seal, inhabit the Arctic seas; with every grade of marine life, down to the animalculæ, which are so numerous as to give their color to great areas of sea-water; and water-fowl, without number, and of many varieties, enlivens the icy shores.

CHIEF DIVISIONS OF THE PLANT KINGDOM

The great divisions of the science of plant life, or botany, are: Structural Botany which treats of the gross anatomy of plants; Plant Histology, of their minute anatomy; Plant Morphology, of the forms of plants and their organs; Plant Physiology, of the functions of these organs; Systematic Botany, of the relationship and classification of plants; Geographical Botany, of the distribution of plants over the surface of the globe; Paleobotany, of the vegetable life of past ages and the successive appearance in the world of the great classes of plants, as traced in their fossil remains; and Economic Botany, which deals with the products of plants and their uses.

It is in the last division of the subject that our greatest practical interest lies, and, consequently, it is best to reverse the general order of treatment pursued by many botanists. Foremost in importance are those plants grown for food, which form the great products of *agriculture*, *gardening* and *horticulture*. Scarcely less important are those which yield fibers used for industrial purposes, such as cotton, flax, jute and hemp; nor must we forget those producing vegetable oils, rubber, and the large number of drugs so valuable to the science of medicine in the alleviation of suffering.

(See page 176 for scientific classification of the Vegetable or Plant Kingdom.)

AN AUTUMN HARVEST OF BEAUTY AND PLENTY

I. CEREALS, GRASSES AND FORAGE PLANTS

Among all the plants in the world, the first place must be given to the food-producing cereals upon which our very existence depends. The most important among these are undoubtedly wheat, barley, oats, rye, rice, Indian corn or maize, millets, sorghum and others less widely used. More than one-half the whole population of the world subsists to a great extent on rice, and the vital importance of wheat needs no demonstration. For our present purposes the use of the word "cereal" is extended to include buckwheat and other starch-yielding plants, but these are not true cereals.

HOW OUR CEREALS WERE DEVELOPED

The cereals are members of a great family of the grasses which have been cultivated by man from time immemorial. Originally, no doubt, they were wild plants which attracted attention owing to the comparatively large quantities of foodstuffs they yielded, the ease with which they could be collected, and their edible qualities. Now, in the majority of cases, the original wild forms are no longer known, and as is common with plants cultivated in many lands and during long periods, innumerable species and varieties have been evolved as the result of selection by man of the forms which appeared desirable for one or other of their qualities.

HOW THE WORD "CEREAL" ORIGINATED

Their very name—cereals or cerealia—indicates the great value attached to them in early historic times. These are so named after the goddess Ceres, as the Romans called her—Demeter of the Greeks—the patroness of agriculture and all the fruits of the earth.

WHERE THE CEREALS GROW

In the temperate regions of the world wheat is the principal cereal grown, and there are many different varieties suited to varying conditions. As we go farther north, barley, oats and rye increase in importance, and although they are grown for special purposes along with wheat, it is important to note that they will

thrive in countries and under conditions not suited to wheat. Starting again from the temperate zones and traveling north or south, as the case may be, we enter the warmer countries where wheat cultivation is often associated with that of rice, corn, sorghum, etc. In the tropics, however, wheat will not thrive at low elevations, but rice, corn, sorghum and various millets form the great cereal crops, their relative importance varying in different countries.

The grasses proper grow upon our meadows, pastures, fields and in the woods and are only used as food for cattle.

HOW THE BOTANIST DESCRIBES CEREALS AND GRASSES

The roots of most kinds of grasses are persistent; the stems are hollow and knotty, and the leaves consist of sheaths and discs. Their flowers are arranged either in spikes or panicles, and are essentially the same in form as those of the herbs. In the interior there is an ovary, from which project two pistils with feathery styles. Close to the ovary are three stamens, with very long filaments and large anthers. These internal organs are generally surrounded by two tender bracts called the *paleæ*, and two harder outer bracts forming the *glumes*. In the grasses also self-fertilization does not take place, the wind here taking the place of the insects. Consequently the anthers are suspended from long filaments, and contain a quantity of pollen. As the grasses do not need to attract insects, their flowers are small with little color, and have no scent; nor do they secrete honey. The fruit is enclosed in a husk.

Alfalfa (*Medicago sativa*) is a cultivated hay and pasture plant, yielding per annum, without reseeding, three to six or more cuttings of hay, averaging a ton each and often much more, for an indefinite period. It is the richest forage plant known, and while old in history is comparatively new to the agriculture of North America.

Alfalfa thrives on all soils except those too wet or having too much acidity. The former calls for drainage and the latter demands lime. Besides its abundance of rich forage, the leaves of which approximate the value of wheat bran in animal rations, it is highly prized as a soil improver, as it restores and enriches the land in which it grows, and improves extraordinarily the physical character of the soil. Its roots reaching to great depths, make it drought-resistant; they also gather much nitrogen from the air, and it yields assuredly whether the season be wet or dry. It has been demonstrated the greatest fertilizing and soil renovating plant known to agriculture.

For hay it is cut whenever the first blossoms appear or when sprouts for a new growth from the root crowns are discovered, which in some regions is every month in the year. It is relished by all live stock, and is particularly valuable in dairy husbandry, affording at lowest cost important ingredients of the well balanced feeding ration. As pasturage it is excellent for hogs and horses, but ruminants, such as cattle and sheep are not safely grazed upon it, owing to its liability to cause bloat, which if not promptly treated may bring speedy death.

Alfalfa requires a carefully prepared seedbed, with a thoroughly fine, smooth surface, as the seeds are small. From fifteen to twenty pounds of seed per acre are generally sown, although often much more, or less, either with drills or broadcast, preferably in early fall and without a nurse crop. Where the winters are long or severe from two to ten tons of hay per acre in a season, and from two to seven bushels of seed.

Blue-Grass (*Poa pratensis*), frequently designated Kentucky Blue Grass, is a perennial, and the most highly prized pasture grass, but is not a profitable hay plant. Its growth has a wider range than timothy. It is sown in autumn or spring, the former being preferable, as it can endure cold better than heat, and thrives rather best when partially shaded. One approved way is to sow the seed on snow, where the ground is free from weeds. It is broadcasted at the rate of about one bushel of seed in the chaff to the acre. Blue-grass is an extremely aggressive and persistent plant voluntarily spreading among and displacing others where it has not been sown. Its taking possession of and thriving on land that has not been cultivated is not uncommon. The seed weighs fourteen pounds to the bushel.

ENGLISH BLUE-GRASS or Meadow Fescue (*Fescuta elatior*) is a valuable and hardy grass either for mowing or pasture. It thrives on soils not too dry, and being long lived, is especially valuable for permanent pastures. It is sown either in the spring or fall, by drilling or broadcasting from one to three pecks per acre if for seed, and three pecks to an acre if for pasture. It is harvested and handled much the same as wheat. Kansas produces nearly seventy-five per cent of the seed raised in America and ninety per cent of the total for the United States is exported, Germany being the largest taker. This grass is very nutritious and grazing animals are fond of it. A bushel of seed weighs twenty-two pounds, and the yield of seed per acre is from five to fifteen bushels.

Brome-grass (*Bromus inermis*) is a vigorous, hardy perennial pasture and hay plant, with strong, creeping rootstocks, and is valuable for dry regions. It is not adapted to a rotation, as its sod becomes too matted and tough for comfortable cultivation. Owing to this tendency, after three or four years of hay cropping its better use is for pasture. It yields luxuriantly, is rich in flesh-forming elements, and much relished by farm animals. It is sown broadcast, in spring or fall, eighteen to twenty pounds of seed to the acre. The seed is chaffy and weighs but fourteen pounds ber bushel.

Barley is grown chiefly in the states of Minnesota, California, Wisconsin, North and South Dakota, in the order named, these states raising seventy-five per cent of the output grown in the United States. It is used as food for live stock, and as an article of commerce is in demand principally for the making of malt in brewing beer, but in California and other western states, where Indian corn does not flourish, barley is used as a substitute grain for horses and mules. About two bushels to the acre are sown in the spring, with

a drill or a broadcast seeder. It is admirably adapted as a nurse crop, as it stands up well and does not shade the ground so much as many other plants.

Barley for malting should be cut before fully ripe and put in well-capped shocks to cure; the price paid is largely governed by the color acquired in curing, which should be bright. A bushel weighs forty-eight pounds, and the yield is from twenty-five to forty bushels per acre.

Buckwheat (*Fagopyrum esculentum*) is a grain of minor importance, its flour being used as human food, mostly in the form of griddle cakes. The plant is esteemed for plowing under in summer, to supply humus, and its blossoms for the honey bee. Most of it is grown in New York and Pennsylvania, and it does well in soils too poor for most other crops. It is sensitive to frost, and used as a sort of catch crop, sown generally about the beginning of July, broadcast. Forty bushels, weighing forty-eight pounds per bushel, is a maximum yield.

Clover (*Trifolium pratense*). In the states east of the Missouri river *red clover* is highly esteemed. It has much the same qualities as alfalfa, except it is a biennial, enduring but two years without re-seeding and at best gives two cuttings of hay per year, aggregating two to three tons. It is from the second cutting that seed is usually saved. Four quarts of seed is a common quantity to sow per acre. Red clover makes excellent hay, except for horses. Its seed, like that of alfalfa, weighs sixty pounds per bushel, and its yield is from one to five bushels ber acre.

WHITE CLOVER (*Trifolium repens*) is a very useful pasture and honey plant, but is not used for hay. It spreads rapidly, and is widely used for sowing with other pasture grasses.

ALSIKE CLOVER (*Trifolium hybridum*) is largely sown on lands not well adapted to red clover, where land is either too wet or too dry for the latter, and it does not require so sweet a soil.

THE COSTLIEST EARS OF CORN IN THE WORLD

The champion ten ears of corn shown in the illustration average ten and one-half inches in length and seven and three-quarters in circumference, each ear carrying twenty rows of kernels, the depth of the kernels being three fourths of an inch, and the average weight of each ear was twenty ounces. They were sold at the rate of $2,345 per bushel or $335 for the ten ears. The champion single ear of corn was sold at the Omaha National Corn Show for $85.

Corn (*Zea mays*). Indian corn, or maize is a product native to America, an annual, and is the most important member of the grass family. It is America's foremost cereal, with a wider adaptability than any other, and is grown in every state and territory. The temperate climate of the Central States is most favorable to it, and Illinois, Iowa, Nebraska, Missouri, Indiana, Kansas and Ohio are the leading states in its planting. The bulk of the world's production of maize is grown in this country, although it is an important crop in Hungary, Italy, Egypt, South Africa, and other parts of the world.

ECONOMIC USES.—Corn is of primary importance as a food for live stock, enormous quantities being used to fatten cattle and swine.

The manufacture of starch and other products from corn is an industry of increasing magnitude. The chief starch derivatives are dextrine and glucose or grape sugar (used in brewing beer and as a substitute for true sugar).

Corn oil may be called a by-product in starch manufacture, yet the annual value of corn oil is greater than that of cornstarch produced in the United States. It is used in soap and paints. Vulcanized by heating with sulphur, it forms a widely used adulterant and substitute for rubber.

Among the dozens of useful products made from corn are corn meal, corn grits, hominy, breakfast foods, beer, whisky, alcohol, cologne spirits, cornstarch, dextrine, glucose, grape sugar, corn sirup, corn oil, soap, rubber substitute and cattle foods.

A special variety of corn is raised to make cob pipes. Compressed corn pith is packed between the double hulls of warships. Corn husks are used in mattresses and paper is made in very limited amount from the leaves and stalks. Large amounts of popcorn, plain and candied, are eaten in the United States.

METHODS OF CULTIVATION.—Owing to its widespread growing, the methods of corn culture vary greatly, and no rigid rules can be laid down for all conditions. For maximum results the cornfield must be rich in humus, its soil finely pulverized, mellow and well drained. Many successful growers in the so-called corn states find these conditions best assured by plowing deeply in the fall, turning under liberal quantities of organic matter such as stable and barnyard manure and leaving the subsoil upturned to benefit from the action of the elements during winter, following with the disk harrow or other like implement in the spring. Planting is done when the soil is thoroughly warmed and when danger of frost is past.

There are two methods of planting commonly practiced, one by drilling or dropping the seed

(three or four grains) in hills with a machine drawn by horses and completing two rows at once. The other is planting with an implement known as a lister, dropping and covering one grain in a place in the bottom of a furrow, at intervals of eight to twelve inches. The latter method is quite extensively followed in the more western of the corn states, such as Kansas, Oklahoma and Nebraska. The lister is a plow and planter combined, with moldboards at once turning the soil to the right and left, opening a furrow, dropping and covering the seed at the same time, economizing labor, time and expense. Corn is planted about two inches deep, and if in hills or rows generally three and one-half feet apart each way. A bushel of fifty-six pounds of seed suffices for planting nearly eight acres. For soiling, forage or ensiling it is planted more thickly.

Cultivation, with horse-drawn cultivators, cleaning one row at a time, and by some implements two rows, repeated three or four times in a season, is given to kill weeds, aid in the retention of moisture, and aerate the soil. This begins in many instances before the plants appear, and often in the earlier stages is done with a harrow and later by using the cultivator, upon which the operator usually rides.

HARVESTING, done after the grains have become hardened is by cutting the stalks from the hills where grown, by hand or machinery, and standing them in large shocks to be husked later, or, husking the ears directly from the stalks without cutting or shocking. No machine equal to human hands has yet been invented for husking corn. The yield ranges from twenty-five to one hundred bushels of sixty pounds, shelled, or seventy pounds unshelled, per acre. The stalks and husks, whether harvested or not are used as food for live stock, and somewhat in manufactures.

Emmer. See Spelt.

Johnson Grass (*Sorghum halapense*) is a coarse perennial, most extensively grown in the South or the Gulf States, for hay. It spreads so persistently and is so difficult to eradicate that its growing is frowned upon by most of the best authorities. One bushel of seed, or thirty-five pounds per acre is about the quantity sown. It is propagated by roots also. Never plant Johnson grass with the expectation of destroying it.

Millet (*Panicum miliaceum*) is a native of the East Indies, and is about three feet high; each panicle contains five to six hundred grains. Hungarian grass is one of the most common grown for hay and grain. In the United States they are principally grown for forage. It is a general rule to sow after corn planting has been done but they may be safely sown considerably later, as a catch crop when the regular hay crop is short or a probable failure. Millets are excellent for ensilage, and a succession of cuttings for that purpose or for soiling can be easily secured by sowing at intervals of two or three weeks from early May to late July. The seed is sown broadcast or with grain drills, mostly broadcast, at the rate of two to three pecks per acre, for hay and somewhat less for seed. The hay is harvested and handled after the manner of other hay crops, and the seed crop as that of other small grains. Well drained, rich, warm, loam soils are preferable for millet, and it does not prosper on thin or poor land. A crop of millet leaves the soil where it grew in a delightful condition of tilth. Its yield of seed is from twenty to forty bushels per acre.

Oats (*Avena sativa*) have a broad panicle; the individual ears are two-rowed, with and without beards. Another much-cultivated species are the bearded oats (*A. orientalis*). The greater portion of the oats crop of the United States is grown in the north central states, more than one-half in the six states of Illinois, Iowa, Minnesota, Wisconsin, Nebraska and Ohio, ranking in order named. Russia is also a large producer and it is cultivated throughout the temperate parts of the civilized world. The yield per acre ranges from twenty-five to one hundred bushels, weighing thirty-two pounds. Oats thrives best in cool weather with abundant moisture, and in the principal oats territory should be sown as early as possible in the spring—earlier than any other spring grain. The ground for oats should be plowed, but it is not uncommon to merely disk harrow the land before sowing. If the latter, about four bushels is sown to the acre, broadcast or drilled, but on well prepared ground ten to twelve pecks of clean, graded seed is sufficient. In the main the oats crop is harvested, stacked and threshed as other small grains.

Oats is used chiefly for horse feed, and in lesser amounts for making oatmeal and breakfast foods.

The manufacture of oatmeal is of relatively small importance since the more nourishing products of wheat are increasingly used.

Orchard Grass (*Dactylis glomerata*) is a hardy, nutritious perennial, growing two to five feet high, that does well in either shade or sunshine. It flourishes in nearly every state between the Mississippi River and the Rocky Mountains, and is profitably grown in all the states east of the Mississippi River lying between thirty-five degrees and forty-seven degrees north latitude, but is partial to a rich soil. Two to three bushels of seed are sown to the acre, from about the middle of March to the middle of April. It provides either hay or pasturage, and is prized for the latter, as "it comes early and stays late."

Rape (*Brassica napus*) is a valuable farm crop, supplies an abundance of succulent green food in a short time, for soiling or pasture, especially for sheep and swine, being ready to use ordinarily six weeks after sowing, and is prized chiefly as a catch crop. Three pounds of seed per acre sown in rows thirty inches apart is customary, and the favorite is the Dwarf Essex.

Redtop, or Herd's Grass (*Agrostis alba*) is a meadow grass and also one of the best pasture plants. It prospers on land where blue-grass, timothy and clover are not thrifty. It is most at home in a moist soil, flourishing in swampy places unfit for almost any other useful grass, and it also has ability to withstand severe drought. On thin soil it makes excellent pasture, but yields lightly of hay. It may be sown in the fall or spring, alone, or with a nurse crop. For meadow, it is best sown alone, using one bushel of seed in the chaff, or half as much if winnowed. A bushel of recleaned seed weighs thirty-five pounds.

Rice (*Oryza sativa*) is grown in nearly all the warmer countries of the earth, and forms the daily food of many millions of people. It is estimated that one-third of the people of the world live principally on rice.

There are two general varieties—the mountain rice and the marsh rice, the latter being the most cultivated. It is usually grown in swampy land or else on irrigated fields. In most countries rice is grown in the most primitive fashion. Immense irrigating plants and modern agricultural machinery make possible the large production in parts of the United States.

It is the chief crop in southeasern Asia, from India through Indo-China, a great part of China, southern Japan and many islands of the Pacific. Rice of excellent quality is raised in Texas, Louisiana and South Carolina, and an amount about equal to the production of this country is imported from eastern Asia.

ECONOMIC USES.—Rough rice or paddy (rice in the hull) is first hulled by machinery and then the grains are polished or whitened. The rice

polish, which consists of the powdered outer coats, is a very nourishing cattle food. Saké, the national drink of Japan, is a weak alcoholic liquor brewed from rice. Rice straw is of enormous use in Asia, being employed for hundreds of purposes, some of them as unexpected as the making of bags, ropes and sandals. Rough rice and clean rice are the common commercial articles.

Rye (*Secale cereale*) is cultivated in all northern countries. The stalk grows up to six feet, and the ears are double-rowed with a long beard. The grain is dark green and very mealy, and furnishes a good bread. It is cultivated in the cold climates of northern Europe, especially in Russia. Only small amounts are grown in the United States.

The leading rye states, in order of yields, are Pennsylvania, Michigan, Wisconsin, New York and Minnesota, which together raised nearly two-thirds of the crop.

It is usually sown at the same time as winter wheat, or earlier, one and a half to two bushels of seed per acre, and its habits and treatment are essentially the same. Its yield per acre is from twenty to fifty bushels, weighing fifty-six pounds. It is noted for its ability to thrive and yield fairly on soils too poor for the more important cereals. Rye is used for breadmaking, live stock food, and in the manufacture of malt and alcoholic beverages. It is the chief breadstuff in parts of Russia, Scandinavia and Germany. It also furnishes valuable pasturage late in the fall and early spring, for which it is extensively sown where early tame grasses do not prosper. Its straw is in considerable demand for various uses, such as the making of paper, filling horse collars, for packing and otherwise.

Sugar-Cane (*Saccharum officinarium*), a tree-like grass, grows nine to fifteen feet high, and contains in its pith a sweet sap, from which our raw sugar is obtained. The sugar-cane is a native of the East Indies, but it is now grown in India, Cuba, Hawaii, Java, Brazil, Mauritius, Louisiana and other parts of the tropics and subtropics. India's large production is consumed locally and enters little into export trade. Louisiana produces all made in the United States, except ten thousand to fifteen thousand tons, annually, from Texas. Cane for molasses and sirup is grown more or less in all of the Gulf Coast states.

METHOD OF CULTIVATION.—It requires a fertile soil, rich in humus. Sandy and clay loams are both good, but alluvial soils are best. In preparing for sugar cane the soil is thrown up by plows in beds six to seven feet wide. In planting, furrows are opened, and in these the cane stalks, one, two or three are laid side by side, covering by plows. It is cultivated largely after the manner of corn, care being taken to leave the rows well ridged up by the last cultivation, to facilitate drainage. The quantity of cane required for planting an acre ranges from four to six tons. Two and sometimes three crops or cuttings are had from one planting. Yields of forty to forty-five tons of stripped cane per acre are not uncommon, although half those quantities are considered creditable averages for large plantations.

MANUFACTURE.—After harvesting, sugar cane is carried (usually by rail) promptly to the mill, where the juice is pressed out. Modern mills have nine rollers, arranged in three sets. The trash, or bagasse, is almost dry when it leaves the last rollers and is used as fuel to run the mill. The juice is boiled down, generally in vacuum pans heated by steam, and the sugar crystals which form are separated from the molasses in centrifugals.

PRODUCTS.—Raw cane sugar, brown to yellowish in color, produced by evaporation of the juice in open pans (muscovados), and crystals from vacuum pans are both important commercially. White sugar, granulated, loaf and pulverized, as commonly sold, is more nearly chemically pure than most other articles of commerce. Molasses, from cane juice boiled in open pans, is palatable for human food, and, like all cane molasses, is fermented and distilled to make rum.

Sorghum is a cultivated grass of many varieties (*Panicum*, *Setaria*, *Andropogon*, etc). Guinea corn, kaffir corn, broom corn and other names are employed to distinguish the different kinds. They may, however, be divided into two classes: the *saccharine* or sweet sorghums and the *non-saccharine*. The sweet sorghums are grown for making sirup, but principally for forage and hay, and yield heavily, from five to fifteen tons per acre. The seed being somewhat bitter is not entirely relished by animals, but it finds a ready market for seeding purposes. For hay about a bushel of seed is sown to the acre, and for fodder and seed about ten pounds per acre is planted in rows and cultivated.

KAFFIR CORN is by far the most valuable of the non-saccharine sorghums. Its grain, of which it yields from thirty to sixty bushels per acre, has a feeding value approximating that of Indian corn, and its forage after the seed heads have been removed is valuable feed for live stock.

MILO is one of the non-saccharine sorghums especially adapted to dry regions, and the most successful summer grain crop for the southern half of the plains country. It does not rank with the sweet sorghums and Kaffir corn as forage, being principally valued for its seed, which makes a satisfactory substitute for Indian corn.

JERUSALEM CORN is also a non-saccharine sorghum. It is cultivated mostly in the cooler climates of the dry regions. It will mature in a short season, and is quite productive of seed, but its fodder yield is light.

BROOM-CORN, a non-saccharine sorghum, is grown only for its brush for making brooms. It is a hardy plant, withstanding dry weather well, and is grown chiefly in Oklahoma, Illinois and Kansas. There are two varieties—the Standard and Dwarf, the former growing taller and producing the longer brush.

In adaptability sorghums cover about as wide a range of soils and climate as corn, and are noted for their drought-resisting powers. Kaffir corn is especially adapted to hot, dry and semi-arid portions of the West, where corn is uncertain, and there it is regarded with increasing appreciation.

In some places the juice of sorghum is boiled down to make sirup or sugar. Common brooms are made of the tops of the Broom-corn.

Spelt (*Triticum Spelta*) is chiefly cultivated in south Germany, but is also grown in a small way in some of our northwestern states. It is sown in both fall and spring, dealt with the same as other wheats, and some authorities recommend it as a very hardy drought-resistant grain for semi-arid regions. About seven pecks of seed are sown to the acre, and the yield is from twenty-five to sixty bushels per acre. The small ears are arranged on a brittle stalk, and consist of three or four blooms, of which, as a rule, only two are fruitful. Spelt is, generally, not bearded. The corn furnishes a white bread. When unripe, it is manufactured into a soup, which is highly esteemed.

Timothy (*Phleum pratense*) is a popular and most widely used hay plant in America, and also extensively seeded with other grasses for pasture, prospering best in moist loams. It yields the year following its sowing, grows from one and a half to four feet high, and twelve to fifteen pounds of seed are sown per acre. The chief timothy region is the northern half of the United

States, east of the 100th meridian, where it is usually sown in the fall with winter wheat, or in the spring with oats. Forty-five pounds of seed make a bushel.

Wheat (*Triticum vulgare*), does not grow as high as the rye, but has a thicker stalk and thicker ears, which are composed of several small ears. In each little ear there are generally four seeds. There are, as a rule, no beards; but, on the other hand, there is often a short spur at the top of the ears. It grows in temperate climates, the largest crops being raised in United States (especially in Minnesota, North Dakota, Ohio, South Dakota and Kansas); Central Europe (Russia, France, Austria-Hungary and Italy); India, Argentina, Canada and Australia. The area of wheat production is steadily increasing and wheat raising has become an important industry in newly developed countries, such as parts of British America, West Australia and Manchuria.

CULTIVATION.—The soil conditions in the Middle West are most favorable for giving quality. Its rich prairies contain large amounts of decaying vegetable matter, and because of the lime and alkaline substances in these soils, the elements of plant food are readily available, particularly the nitrogen in the soil, that contributes so largely to the glutinous character of the wheat.

Wheat is more than ordinarily adapted to machine farming and the invention of the successful reaper was largely responsible for the rapid increase of wheat acreage in America. In many parts of the wheat region immense plows drawn by traction engines and turning six to twelve and more furrows are employed. In other portions where operations are large many fields are plowed only once in two or three years. For various reasons, among which may be mentioned the control of weeds and the conserving of moisture in the soil, early plowing for winter wheat is preferable, and where the rainfall is scant very satisfactory conditions are obtained by stirring the surface soil with disc harrows only.

The average quantity of seed sown per acre is between four and five pecks, varying with the quality, the locality, method and time of seeding and the whim of the sower. The yield ranges from ten to sixty bushels per acre, the bushel weighing sixty pounds.

Wheat is mostly sown with drills, the old method of sowing broadcast having been mostly abandoned. By drilling a more even distribution and covering of the seed, and a better stand and yield of grain may be confidently expected.

In harvesting small areas the self-binding reaping machine is popular. This cuts the standing grain and binds it in sheaves of convenient size which are stood in shocks of three or four dozen bundles each, whence it is either threshed direct or put in stacks for threshing at a more convenient season. On larger areas and especially where the wheat is quite ripe, the header is commonly and widely used. This clips off the heads of grain, and elevates them into large receptacles called barges, set on wagons, leaving the straw standing. Usually when headed the grain is put directly into stacks, and threshed at convenience.

ECONOMIC PRODUCTS.—Its commercial varieties, hard, soft, red, white, etc., differ in percentage of starch and gluten.

The whole grain is ground into graham flour, made into breakfast foods and used in brewing.

From parts of the grain are prepared whole wheat flour, white flour, middlings, bran, wheat grits, wheat starch, macaroni, spaghetti, etc.

Wheatflour may be said to be the standard foodstuff of modern civilized man.

Macaroni is made from special varieties of hard, glutinous wheat.

Wheat straw is plaited into braids (Leghorn, etc.) for hat making, and is used like the straw from other grains for packing material and as bedding for animals.

Straw braids come largely from Italy, China and Japan.

The principal countries exporting wheat are United States, Russia, Argentina, Canada, Roumania, India and Australia.

II. KITCHEN VEGETABLES

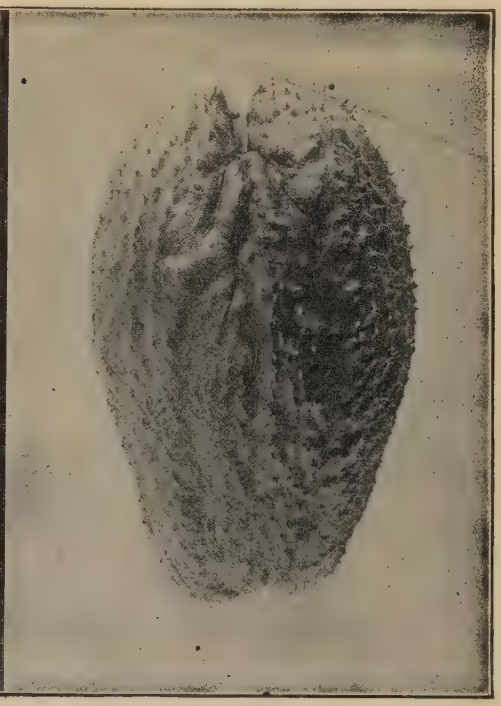
Among the commercial products of the world, vegetables are a most important item, and their value as foodstuffs needs no emphasizing. The inhabitants of the world could subsist without animal-flesh, could scarcely subsist entirely on cereals, but they most certainly could not subsist without vegetables. Practically every nation, savage and civilized alike, cultivates a few plants for use as vegetables. The vegetables we know and prize most are one and all the result of long cultivation, the origin of most being lost in antiquity. The world has been ransacked, and for the vegetables cultivated in America nearly every country under the sun has been laid under contribution.

Asparagus (*Asparagus officinalis*). The common Asparagus is a native of Great Britain, Russia and Poland. It is one of the oldest as well as one of the most delicious of our garden vegetables. It was cultivated in the time of Cato the Elder, 200 B. C.; and Pliny mentions a sort that grew in his time near Ravenna, of which three heads would weigh a pound. As many of our best gardeners contend, adaptation of soil, together with thorough cultivation, alone explains the difference in this vegetable, as offered in our markets or seen in our gardens.

Bean (*Phaseolus vulgaris*) is cultivated in many countries for the sake of its seed and husks. By cultivation many varieties have been produced, of which the following are the best known: BROAD BEAN, an important article of food in Europe and western Asia, and valuable forage plant, grown in gardens and as a field crop. All species of the bean have a very high food value; are relatively cheap in price, but much less easily digested than cereals. LIMA BEAN, widely cultivated in tropical Africa, sparingly in temperate regions. Production in the United States most extensive in California. NAVY or KIDNEY BEAN, extensively grown in the United States, over one hundred and fifty varieties of which are in cultivation as a garden vegetable, "string beans," fodder and for food. The closely related "frijole" is universally grown in Mexico and Spanish American countries where it ranks next to maize as a staple food. SOY BEAN, the common bean of China and Japan is grown in immense quantities. Various preparations form

NEWEST VEGETABLES GROWN IN AMERICAN GARDENS

UDO—This fine salad vegetable comes from Japan, is similar to asparagus, and much easier to grow. It has a fresh taste like lettuce with an agreeable flavor. There are numerous ways of serving it, but it is possibly best simply boiled and seasoned like asparagus. It will grow in any soil suitable for asparagus.



THE CHAYOTE, or Vegetable Pear, is large, green and pear-shaped, with a texture somewhat like a squash, and a flavor more delicate than a cucumber. It is grown on lowlands near the coast, in a moderately warm climate. Its keeping qualities are remarkable, making it an excellent winter vegetable. Both roots and stalks are also edible.

THE BUR ARTICHOKE, long imported from France, may now be successfully grown in this country. It is used like the cauliflower in many ways but commands a higher price. The scalelike leaves make a delicious salad when pulled apart after boiling, and may be served on lettuce with either mayonnaise or French dressing.

THE PETSAI, or Odorless Cabbage, is much superior to the ordinary cabbage, and is wholly without disagreeable odor. It does not closely resemble cabbage in appearance; it is rather tall than squatty, and the leaves cluster around the stalk compactly. It requires cultivation similar to cabbage but is not transplanted. It is served aft r the fashion of cabbage.

a part of the daily food. It is now grown in Europe and southern and southwestern United States as forage and soiling crop.

Brussels Sprouts, or Bud-bearing Cabbage (*B. oleracea bullata minor*) originated in Belgium, and has been cultivated around Brussels from time immemorial, although it is only within the last fifty years that it has become generally known in this country. It is so named on account of its peculiar habit, producing a bud-like cluster of leaves in the axil of each leaf from the base to the top of the stem. These buds or sprouts are the parts of the plant that are eaten, and are highly esteemed for their delicate flavor and wholesome quality. Brussels sprouts is one of the hardiest of green winter vegetables. As a rule, the shorter-stemmed strains have the largest and most compact sprouts, and are consequently the most favored. As regards cultivation, the plant, like all of the cabbage tribe, requires deep, rich soil to bring it to fullest perfection.

Cabbage (*Brassica oleraceæ*) is found in a wild state in various parts of Europe and in southern England, always on maritime cliffs. It is a biennial, with fleshy lobed leaves covered with a glaucous bloom; altogether so different in form and appearance from the cabbage of our gardens that few would believe it could possibly have been the parent of so varied a progeny as are comprised in the Savoy, Brussels Sprouts, Cauliflower, Broccoli and other numerous varieties. Over one hundred fifty varieties are enumerated. The common or cultivated cabbage is well known, and from a very early period has been a favorite culinary vegetable in almost daily use throughout the civilized world.

Carrot (*Daucus*) of which there are about twenty species are mostly natives of the Mediterranean countries. The common carrot is a biennial plant and is universally cultivated for the sake of its root. In all varieties of the wild plant this is slender, woody and of a very strong flavor; and that of the cultivated variety is much thicker and more fleshy, much milder in its flavor and qualities. Its color is generally red, but sometimes orange or yellowish white.

Cauliflower (*B. oleracea botrytis cauliflora*) is of great antiquity, but its origin is unknown, although it is usually ascribed to Italy. To the English and Dutch gardeners we are chiefly indebted for the perfection it has attained. Heads of immense size are now grown for the market. It is by no means uncommon to see a head perfectly sound and smooth, fully ten inches in diameter, and, contrary to the usual rule, size is not obtained at the expense of quality, the larger, if differing at all, being more tender and delicious. The varieties of the Cauliflower are numerous.

Celery (*Apium graveolens*). The plant is hardy, and is largely cultivated in the United States, Canada and Europe. In cultivation, however, abundant nutrition has greatly mollified its properties, and two principal forms have arisen. The first sort is the common celery, where the familiar long blanched succulent stalks are produced by transplanting the seedlings into richly manured trenches, which are filled up as the plants grow, and finally raised into ridges over which little more than the tops of the leaves appear; and a supply is thus insured throughout the whole winter. The other form is the turnip-rooted celery, or celeriac.

Cucumber (*Cucumis sativus*). The common cucumber is distinguished by heart-shaped leaves, which are rough with hairs approaching to bristles, and oblong fruit. It is a native of the middle and south of Asia, and has been cultivated from the earliest times. Its fruit forms an important article of food in its native regions, the south of Europe, etc., and an esteemed delicacy in colder countries, where it is produced by the aid of artificial heat. Many varieties are in cultivation, with fruit from four inches to two feet long, rough, smooth, etc.

VEGETABLE MARROW (*Cucurbita ovifera*) is closely allied to the cucumber, and is supposed to have been originally brought from Persia. Like the cucumber it is a tender annual, but succeeds out of doors in summer in this country.

Many other members of the cucumber family are cultivated as esculents, notably in the warmer parts of the world. Of these the chief are Pumpkins, Melon Pumpkin, Water Melon, Chocho, Bottle Gourd, Squash.

Egg-plant (*Solanum melongena*). The egg-like fruit known as egg-apple, etc., is a favorite article of food in the East Indies, and has thence been introduced to most warm countries. It varies in size from that of a hen's egg to that of a swan's egg, in color from white or yellow to violet. Egg-plants are much grown in the United States, where "Jew's-apple" is one of the names for the fruit.

Kale, or Borecole (*B. oleracea acephala*) is distinguished by its leaves being beautifully cut and curled, of a green or purple color, or variegated with red, green, and yellow, never closing so as to form a heart, nor producing edible flower heads like a Cauliflower. Its leaves and tender shoots are not only edible but form one of the most useful green vegetables.

Lentils (*Ervum Lens*), a slender plant supposed to be native of Western Asia, Greece and Italy. The Lentil was introduced into Egypt as a cultivated plant at an early date, and from this center spread east and west. It is a weak, straggling plant, rarely exceeding eighteen inches high, often much more dwarfed, having pinnate leaves terminating in tendrils. The flowers are white, lilac, or pale blue, small and formed like those of a pea. There are three varieties of lentil recognized in the countries in which it is cultivated: the small brown, which is the lightest flavored and the best esteemed for soups and haricots; the yellow variety, which is slightly larger; and the lentil of Provence, France, which has seeds as large as a small pea, but is better appreciated as fodder for cattle than for food for man.

Lettuce (*Lactuca sativa*). The garden lettuce is supposed to be a native of the East Indies, but is not known to exist anywhere in a wild state, and from remote antiquity has been cultivated as an esculent and particularly as a salad. It has a leafy stem, oblong leaves, a spreading, flat-topped panicle, with yellow flowers, and a fruit without margin. It is now generally cultivated in all parts of the world where the climate admits of it.

Melon (*Cucumis melo*), a plant of the same genus with the cucumber, much cultivated for its fruit. The melon is an annual, with trailing or climbing stems, lateral tendrils, rounded, angular leaves, small, yellow flowers and large round or somewhat ovate fruit. The varieties in cultivation are very numerous, some of them distinguished by a thick and warty rind, some by a rind cracked in a net-like manner, some by ribs and furrows, some by a perfectly smooth and thin rind; they differ also in the color of the flesh of the fruit, which is green, red, yellow, etc.; and in the size of the fruit, which varies from three or four inches to a foot or more in diameter. They are widely cultivated in the United States, ranking fifth in acreage among vegetables. New Jersey leads in production, growing about one-seventh of entire crop. Cultivation under irrigation is highly developed in Colorado. They are often called cantaloupe in the markets.

Mushroom. See Cryptogams.

Okra or Gumbo (*Hibiscus esculentus*) is a generally used food plant most commonly employed in soups in the East and West Indies and also in the southern United States. It was anciently grown in tropical Africa and Egypt, and is now

diffused in tropical countries and in the southern United States.

Onion (*Allium Cepa*) is extensively cultivated throughout the world, and is grown in every state in the United States, New York and Ohio leading in production. Bermuda and Spanish varieties are now grown in California. It was cultivated by the ancient Egyptians; also by the Greeks and Romans. Many other important vegetables are allied to the onion, viz.: Leek, Shallot, Onion, Chives and Garlic. All of these are highly esteemed in cookery.

Parsnip (*Pastinaca*), an annual, biennial, or perennial herb, with carrot-like, often fleshy root and pinnate leaves. The parsnip has long been cultivated for the sake of its root, which in cultivation has greatly increased in size and become more fleshy. The flavor is disliked by some, as well as the too great sweetness, but highly relished by others; and the root of the parsnip is more nutritious than that of the carrot. The crop is also on many soils of larger quantity; and although the parsnip delights in a very open, rich soil, it will succeed in clayey soils far too stiff for the carrot.

Pea (*Pisum sativum*) has been cultivated from very remote times. The pea plant is covered with a delicate, glaucous bloom, and its white or pale violet flowers are familiar to all. The pods are pendulous, smooth, deep green and variable in size and may contain any number up to thirteen (rarely more) peas. The peas when ripe are also variable, some being white and round, others blue and wrinkled, and a few large, irregular, and dull green. They are cultivated in Europe, Asia and the United States. Chiefly used as green vegetable, but also for fodder. Ranks seventh in acreage among minor vegetables in the United States.

Peppers or Capsicums or Chilles (*Capsicum annum* and *C. frutescens*) are widely cultivated in the warmer parts of both hemispheres. The fruits vary considerably in shape and size, and when green are cooked and eaten as a vegetable.

Potato (*Solanum tuberosum*) is the greatest of vegetable gifts to man. Its cabbage-like stalks have a height of from eighteen to twenty inches; its leaves are solitary and pennate; its large pentagonal blossoms are white, reddish or violet; its fruit is a green berry. Attached to its underground runners are those bulbs which serve as food to many millions of people, and from which starch, sago, sugar of grapes and brandy are prepared.

The potato stands second only to corn as the most important contribution of America to the food plants of the world. Preëminently the most important vegetable grown in Europe and America. The world crop is enormous, exceeding five billion bushels; in bulk surpassing by about one-half the world crop of wheat, corn or oats. Germany, Russia, Austria-Hungary, France, the United States and Great Britain are the chief producers in order named. Germany grows one-third of the world crop, Russia one-fifth. In the United States they are grown in every state and territory; also in Hawaii and Alaska.

Their cultivation was even ancient in Peru. It was widely diffused from Chile to Colombia at time of Spanish discovery, but there were no evidences of culture in Mexico or by North American Indians. It was introduced into what is now North Carolina and Virginia late in the sixteenth century; taken to Europe first by the Spaniards early in the sixteenth century and to England by Sir Walter Raleigh in 1585. SWEET POTATOES are the thickened roots of *Ipomoea Batatas*, a climbing plant. This plant is extensively cultivated in most tropical countries, although not known in a wild state. The root contains much starch and saccharine matter. They are second only to the potato in the United States, being widely grown in the South—Georgia, North Carolina, Alabama, South Carolina and Tennessee producing over half of the total crop, which in acreage and value is about one-fifth that of the potato.

Radish (*Raphanus sativus*) is a well-known plant, the root of which is a valuable salad; it has been cultivated from a remote period. It is now possible to have a supply the whole year round. Crisp, tender radishes with delicate flavor are only obtained by quick growth on rich, moist soil. The earliest crops are grown in frames on hotbeds, the crop being ready about five weeks from sowing. The earliest sowing outdoors can be made from December to February in sheltered sunny positions, the beds being covered with a thick layer of litter. There are round, oval and long-rooted varieties.

Tomato or Love-apple (*Lycopersicum esculentum*). The fruit of this plant is fleshy, usually red or yellow, divided into two, three or more cells containing numerous seeds imbedded in pulp. The tomato is one of a genus of several species, all natives of South America, chiefly on the Peruvian side. In the warmer countries of the United States, Europe and other countries in which the summer is warm and prolonged, it has long been cultivated for the excellent qualities of the fruit as an article of diet. The tomato is extensively grown as a field crop for canneries in the United States, and in the North is one of the chief winter-forcing crops. It is exceeded in acreage only by the watermelon and sweet corn among the minor vegetables. In the United States the crop exceeds thirty million bushels, nearly half of which is grown in Maryland and New Jersey.

Turnip (*Brassica rapa*). Although the turnip is of great value for feeding stock, it is not very nutritious, no less than nine to ninety-six parts of its weight actually consisting of water. One of the best early varieties is purple top strap leaf. Early flat Dutch is also good. The Swedish turnip, or *ruta baga*, which was introduced into cultivation from the north of Europe more recently than the common turnip, and has proved of very great value to the farmer, is regarded by some botanists as a variety of the same species, and by some as a variety of *B. napus*, but more generally as a variety of *B. campestris*, a species common in cornfields and sides of ditches in Britain and the north of Europe.

Watermelon (*Citrullus vulgaris*). The most popular melon in cultivation, is extensively grown in warm climates throughout the world, but most abundantly in southern Russia and the southern United States. It leads all minor vegetables in acreage, being surpassed only by the major vegetables, potato and sweet potato. Texas, Georgia, North Carolina and Missouri are the chief growers in the order named. Very anciently it was cultivated by Egyptians.

Yam (*Dioscorea alata*). Yams, the tubers of various species of *Dioscorea*, are cultivated in nearly all tropical countries. Yam tubers abound in farinaceous matter and often reach a large size. They resemble but are inferior to the sweet potato.

PLANTING TABLE FOR GARDEN VEGETABLES

Time given is for latitude of New York. Each one hundred miles north or south will make a difference of from five to seven days in the season. The distances given here indicate the distance apart the plants should stand after thinning. The seed should be sown much nearer together. CLASS A. These plants may be started early (in the greenhouse or hotbed, in early spring, or outdoors in the seedbed later), and afterwards transplanted to their permanent location. CLASS B. These crops usually occupy the ground for the entire season. CLASS C. These are quick maturing crops which, for a constant supply, should be planted at several different times in "succession"—a week or two weeks apart. CLASS D. These are crops which often may be cleared off in time to permit planting another quickly maturing crop, usually of some early variety. CLASS E. These crops are supplementary to those in Class D and may be used to obtain a second crop out of the ground from which early crops have been cleared.

Name and Variety	Time to Plant	Class	How to Plant and Care for
Asparagus (Plant)	April.	B	Plant 4 inches deep, at distance of 1 foot; in rows 3 feet apart; heavily manured, spreading the roots out evenly. Do not cut for use until *second* spring. Keep bed clean; cut off tops in the fall. Transplant third spring.
Asparagus (Seed).	April-May.	B	Seed 2 to 4 inches apart, in rows 15 inches apart; 1 inch deep.
Beans, Bush Lima. Burpee Improved.	March 15, under glass. May 1, outside.	B	Tender. Set out in May. Plant 2 inches deep in rows 2 feet apart.
Beans, Pole Lima. King of Garden.	May 15, outside. Ready in 10 weeks.	B	Tender. Plant 2 inches deep in hills 4 feet apart. Pinch off at 6 feet high. 1 pint of seed to 50 hills.
Beans, String. Bountiful. Hodson Wax. Bountiful. Hodson Wax. Bountiful. Hodson Wax. Bountiful.	April 15, outside. May 1, outside. May 15, outside. June 1, outside. June 15, outside. July 1, outside. July 15, outside. Ready in 6 weeks.	C	Tender. Plant 2 inches deep in rows 2 feet apart, 6 inches apart in row. 1 pint of seed to 75-foot row.
Beets. Eclipse. Crimson Globe.	March 1, under glass. April 15, outside. May 15, outside. June 15, outside. July 15, outside. Ready in 9 weeks.	A-D B-E	Transplant outside in April. Hardy. Plant 1 inch deep in rows 2 feet apart, 6 inches apart in row. Soak seed over night. 1 ounce of seed to 50 feet. Winter in sand or pits.
Brussels Sprouts. L. I. Half Dwarf.	March 15, under glass. May 1, under glass. Ready in 20 weeks.	A-E	Plant ½ inch deep in rows 2 feet apart, 1 foot apart in row. 1 ounce of seed to 1500 plants. Hang in cellar for winter.
Cabbage. Copenhagen Market. Drumhead Savoy.	March 1, under glass. March 1, under glass. May 1, under glass. Transplant to garden. Ready in 18 weeks.	A-C	Hardy. Plant ½ inch deep in rows 3 feet apart, 2 feet apart in row. Manure well. 1 ounce of seed to 2500 plants. Winter in pits upside down.
Carrot. Half-long Danvers.	April 1, outside. June 1, outside. Ready in 15 weeks.	C-B	Hardy. Plant ½ inch deep in rows 1½ feet apart, 6 inches apart in row. 1 ounce of seed to 100 feet. Winter in sand or pits.
Cauliflower. Dwarf Erfurt.	March 1, under glass. April 1, under glass. May 1, under glass. Transplant to garden.	A-C-E	Hardy. Plant ½ inch deep in rows 3 feet apart, 2 feet apart in row. 1 ounce seed to 2500 plants. Manure well.
Chard. Lucullus.	April 15, outside. Ready in 8 weeks.		Hardy. Plant 1 inch deep in rows 2 feet apart, 1 foot apart in row. 1 ounce of seed to 50 feet.
Celery. Golden Self-blanching. Fin de Siecle.	March 1 , under glass. April 15, under glass. Ready in 18 weeks.	A-E	Hardy. Set out in May. Barely cover. Rows 3 feet apart, ½ feet apart in row. Rich, moist soil. Transplant twice. 1 ounce of seed to 3000 plants. In August bank up to blanch. Winter in pits.
Corn. Golden Bantam. Evergreen. Country Gentleman. Mexican. Country Gentleman.	April 1, under glass. April 15, outside. May 1, outside. May 1, outside. May 15, outside. June 1, outside. June 1, outside. June 15, outside. July 15, outside. Ready: Early 9 weeks. Late 11 weeks.	B-E	Tender. Set out in May. Plant 2 inches deep in rows 4 feet apart, 2 feet apart in row. Manure and remove suckers. 1 quart of seed to 200 hills.
Cucumber. Cool and Crisp.	March 15, under glass. May 1, outside. June 1, outside. July 1, outside. Ready in 9 weeks.	A-B	Tender. Set out in May. Plant 1 inch deep, 4 feet apart. 1 ounce of seed to 50 hills.

PLANTING TABLE FOR GARDEN VEGETABLES—Continued

Name and Variety	Time to Plant	Class	How to Plant and Care for
Endive. Green Curled.	July 1. Ready in 8 weeks.	A-E	Hardy. Plant in rows 2 feet apart, 1 foot apart in row. 1 ounce of seed to 100-foot row. Transplant to dark cellar to blanch for winter.
Eggplant. Black Beauty.	March 1, under glass, with good heat. Transplant to garden. Ready in 15 weeks.	A-B	Very tender. Plant ½ inch deep in rows 3 feet apart, 2 feet apart in row. Rich and moist soil. 1 ounce of seed to 1000 plants. Store dry for late fall use.
Kale. Dwarf Scotch. Siberian.	May 15, under glass. Transplant to garden like cabbage. July 1, outside. Ready in 20 weeks.	E	Hardy. Plant ½ inch deep in rows 2 feet apart, 1 foot apart in row. 1 ounce of seed to 200 feet. Mulch for winter.
Lettuce. May King.	March 1, under glass. March 15, under glass. Outside every 2 weeks to Sept. 1. Ready in 6 weeks.	C	Hardy. Plant ¼ inch deep in rows 1½ feet apart. Rich soil. 1 ounce of seed to 3000 plants. Shade and water in summer.
Muskmelon. Emerald Gem. Osage. Early Hackensack.	May 1, outside. May 1, outside. May 1, outside. Ready in 6 weeks.	A-B	Plant 1 inch deep in hills four feet apart. Pinch off ends of shoots. Make special soil of sand and manure. 1 ounce of seed to 50 hills.
Watermelon. Cole's Early. Halbert Honey. Cole's Early. Halbert Honey.	May 1, outside. May 1, outside.	B	Tender. Plant 1 inch deep in hills 6 feet apart. Make special soil of sand and manure. Pinch off ends of shoots. 1 ounce of seed to 30 hills.
Onion. Yellow Danvers. Prizetakers.	April 1, plant sets. Seeds April 15, outside. Seeds April 15, outside. Ready in 18 weeks from seed.	A-B	Hardy. Plant seeds ½ inch deep; sets 2 inches deep in rows 2 feet apart. 1 ounce of seed to 150 feet. Dig and dry for winter. 1 quart sets to 100 feet.
Parsley. Triple Curled.	April 15, outside. Ready in 8 weeks.	B	Hardy. Plant ½ inch deep in rows 2 feet apart, 6 inches apart in row. Soak seeds over night. Seeds are slow to start. 1 ounce of seed to 150-foot row.
Parsnip. Hollow Crown.	April 15, outside. Ready in 15 weeks.	B	Hardy. Plant ½ inch deep in rows 1½ feet apart. Seeds start slowly. 1 ounce seed to 200 feet. Winter in place or in pits. Improved by frost.
Peas. Thomas Laxton. Juno. Telephone.	April 15, outside. May 1, outside. May 1, outside. May 15, outside. June 1, outside. June 15, outside. July 1, outside. July 15, outside. Ready in 8 weeks.	B-E	Hardy. Plant early varieties 4 inches deep and late varieties 3 inches deep. Early in double rows and late in rows 3 feet apart. Moist soil. 1 quart of seed to 150 feet.
Pepper. Chinese Giant.	March 1, under glass. Set out in May. Ready in 20 weeks.	A	Very tender. Plant ½ inch deep in rows 2 feet apart. Start in good heat. Hang in cellar for winter.
Potatoes. Noroton Beauty. Gold Coin.	April 1 (early). May 1 (early). May 15 (main crop). Ready in 12 weeks.	B	Plant early varieties 2 inches deep, and late varieties 5 inches deep in rows 3 feet apart. 1 peck to 100-foot row. 8 or 10 bushels to acre. Sprout before planting.
Pumpkin. Winter Luxury.	May 15, outside. Ready in 15 weeks.	B	Tender. Plant 6 feet apart. Manure. 1 ounce of seed to 50 hills. Winter warm and dry.
Radish. French Breakfast.	March 7, under glass and every 2 weeks. Ready in 4 weeks.	C	Hardy. Plant ½ inch deep. 1 ounce of seed to 100 feet. Soil light and rich.
Rhubarb (Plant).	April.	B	Set out root-clumps at distance of 2 to 3 feet, in rows 3 to 4 feet apart. Give them dressing of bone meal and soda in the spring.
Salsify. Mammoth Sandwich Island.	April 15, outside. Ready in 18 weeks.	B	Hardy. Plant ¼ inch deep in rows 2 feet apart. 1 ounce of seed to 100 feet. Winter in place or in pits.
Spinach. Victoria. New Zealand.	April 1, outside. April 15, outside. May 1, outside. May 1, outside. June 1, outside. Sept. 1, outside. Ready in 5 weeks.	A-B-E	Hardy. Plant 1 inch deep in rows 1½ feet apart. 1 ounce of seed to 200 feet. Very rich soil. Winter under straw cover.

PLANTING TABLE FOR GARDEN VEGETABLES—Continued

Name and Variety	Time to Plant	Class	How to Plant and Care for
Squash. Crookneck. Delicata. Early Golden Custard. Crookneck. Hubbard.	March 15, under glass. May 15, outside. May 15, outside. May 15, outside. Ready in 7 weeks. May 15, outside. Ready in 15 weeks.	B	Tender. Plant 1 inch deep, 4 feet apart, Hubbard 6 feet apart. Winter warm and dry. 1 ounce of seed for 25 hills. For Hubbard make special soil of sand and manure.
Tomato. Earliana. Crimson Cushion.	March 1, under glass. April 1, under glass. Set out in May. Ready in 18 weeks.	B-A	Tender. Plant ½ inch deep in rows 3 feet apart, 3 feet apart in row. Keep hotbed cool. Pinch off side shoots. 1 ounce of seed to 2000 plants. Hang in cellar for early winter.
Turnip. Early Milan White.	April 17, outside. June 15, outside. Ready in 9 weeks.	C	Hardy. Plant ½ inch deep in rows 1½ feet apart. 1 ounce of seed to 200 feet. Winter in pits.

PLANTING TABLE FOR GARDEN VEGETABLES—Continued
Especially Adapted to Southern United States

Name and Variety	Time to Plant	Class	How to Plant and Care for
Artichoke, Jerusalem.	March 1, outside. Ready in 6 to 8 months.		Hardy Perennial. Plant tubers 6 inches deep in rows 5 feet apart, 2 feet apart in row. Light soil and sun. 2 quarts of tubers to 100 feet. Fine for soup or boiled and creamed, or salad or pickles.
Asparagus. Palmetto.	December, outside. Ready in February or March.	B	Hardy. Plant 2-year roots 8 inches deep in rows 2 feet apart, 1 foot apart in row. Rich and moist mulch with manure all summer, salt well.
Beans. Valentine or Refugee or Golden Wax	Cold-frames or greenhouse. September 1 and every two weeks thereafter. Ready in 6 weeks.	B-C	Tender. Plant seeds 2 inches deep in rows 1½ feet apart, 4 inches apart in row. Not too rich soil. 1 quart for 150 feet.
Beets. Eclipse or Crimson Globe.	Sept. 1, outside. Oct. 1, outside. Ready in 9 weeks.	A-D B-E	Hardy. Plant 1 inch deep in rows 1½ feet apart. Thin to 4 inches apart. Deep soil, no fresh manure. 1 ounce to 50 feet. Soak seed over night.
Chard. Lucullus.	Sept. 15, cold-frame.		Almost hardy. Grow like beets. Use outside leaves, leaving crown to grow. Use for greens, or leaf stalks like asparagus.
Brussels Sprouts.	Seed-bed August 1. Transplant outside September 15. Ready in 4 months.	A-E	Hardy. Plant seeds ½ inch deep in rows 2 feet apart, 1½ feet apart in row. Cultivate like cabbage. 1 packet of seed enough.
Cabbage. Wakefield or Savoy or Winningstadt.	Seed-bed August 15. Transplant outside September. Ready in 4 months.	A-C-E	Hardy. Plant seeds ½ inch deep. Plant: rows 3 feet apart; 1½ feet apart in rows Moist, manure and cultivate well. 1 packet of seed enough. Set plants deep.
Carrots. Half Long or Long Orange.	Aug. 15, outside. Oct. 1, outside. Ready 12 to 15 weeks.	C-B	Hardy. Plant ½ inch deep in rows 1½ feet apart, 4 inches apart in row. 1 ounce for 200 feet. Seed slow to start.
Cauliflower. Early Snowball or Dwarf Erfurt.	Seed-bed September 1. Transplant to cold-frames October 1. Ready in 4 months.	A-C-E	Almost hardy. Plant seed ½ inch deep in rows 2 feet part, 1½ feet apart in row. Moist, rich and manure. 1 packet of seed enough. Blanch heads by tying up.
Collards.	Cultivate like cabbage.		A non-heading cabbage not equal to it in quality.
Cucumber. English Telegraph.	Sept. 15, greenhouse. Oct. 15, greenhouse. Nov. 15, greenhouse. Dec. 15, greenhouse. Day heat, 85°. Night heat, 65°. Ready in 6 to 8 weeks.	A-B	Tender. Plant 1 inch deep, 5 feet apart. 1 ounce for 50 hills. Moist, rich soil. Pinch out main stem when 2 feet long. Pinch outside branches at 6 or 8 feet. Leave only 3 side branches to a plant and only half the fruit. Do not fertilize blossoms.
Cress, Water.	Outside in water. September 1. Ready in 3 months.		Hardy. Sow in quiet pool near running water. Start seed on mud, then flood 3 inches deep. 1 packet of seed enough.
Endive. Green curled or Self-blanching.	Sept. 1, outside. Nov. 1, outside or in cold-frames. Ready in 3 months.	A-E	Hardy. Plant ½ inch deep in rows 1½ feet apart. Thin to 10 inches apart in row. Light, rich soil, deep. 1 ounce for 100 feet. Can transplant like lettuce. Tie up heads for blanching 2 weeks before use.

PLANTING TABLE FOR GARDEN VEGETABLES—Continued

Especially Adapted to Southern United States

Name and Variety	Time to Plant	Class	How to Plant and Care for
Eggplant. Round Purple.	Aug. 15, greenhouse. Dry heat, day, 90°. Dry heat, night, 65°. Ready in 4 or 5 months.	A-B	Very tender. Plant ½ inch deep, 2 feet apart. Rich and moist soil. 1 packet enough. Blossoms should be fertilized by hand.
Kale. Dwarf Scotch or Tall Scotch.	Aug. 15, seed-bed. Sept. 15, set outside. Sept. 15, start some. October, set outside. Ready in 3 or 4 months.	E	Hardy. Plant ½ inch deep in rows 1½ feet apart, 1 foot apart in row. Deep sand and mold. 1 ounce to 200 feet. When top is cut off for use, side shoots will start.
Kohlrabi. Early Vienna.	October 1, outside. Ready in 2 to 3 months.	C	Hardy. Plant ½ inch deep in rows 1½ feet apart, 6 inches apart in row. 1 ounce for 150 feet. Grow and use like turnip.
Lettuce. May King or California Butter or Boston Market.	Seed-bed September 15 and every 2 weeks after. Transplant into cold-frames.	C	Almost hardy. ¼ inch deep, 6 inches apart each way. Light, rich soil. 1 ounce for 2000 plants.
Muskmelon. English: Sutton's Ar. Sutton's Emerald Gem.	August 15, greenhouse. Dry heat, day 90°. Dry heat, night, 70°. Ready in 4 to 5 months. Sets ready 2 months.	A-B	Tender. Plant 1 inch deep in hills 5 feet apart. Manure. Light soil. 1 ounce for 50 hills. Blossoms to be fertilized by hand. Pinch off tip of vine when first blossoms come.
Onions. Prizetaker or Multiplier or Globe.	July 1, outside, seed. Sept. 1, outside, sets. Ready in 4 to 5 months.	A-B	Hardy. Plant seed ½ inch deep, sets 2 inches deep in rows 1½ feet apart. Moist, rich soil and sun. 1 ounce of seed for 150 feet. 1 quart of sets for 100 feet.
Parsley.	September 1, outside. Soak seeds over night. Ready in 2 months.	B	Hardy. Plant ¼ inch deep in rows 1½ feet apart. 1 packet seed enough. Seeds slow to start.
Parsnip. Hollow Crown	September 1, outside.	B	Hardy. Plant ½ inch deep in rows 1½ feet apart, 3 inches apart in row. Seeds slow to start. Rich, deep soil. 1 ounce for 200 feet.
Peanuts. Virginia or Georgia.	April 1, outside.		Plant 3 inches deep in hills 2 feet apart. Light, deep soil. Shell before planting.
Peas. Nott's Excelsior. Gradus or Tom Thumb. Extra Early (smooth varieties). Marrow Fat.	In cold-frames. September 15 and every 2 weeks. Ready in 2 to 3 months. Outside same dates (always an uncertain crop). Outside, December 1 (more hardy, less quality).	B-E	Almost hardy. Plant 4 inches deep in rows 2 feet apart. Moist, not too rich. Soak over night. 1 pint to 100 feet.
Pepper. Sweet Spanish or Sweet Mountain.	August 1, greenhouse. Moist heat, day, 90°. Moist heat, night, 70°. Ready in 4 months.	B	Tender. Plant seeds ½ inch deep, 2 feet apart. 1 packet of seed enough. Need not fertilize blossoms.
Potato. Irish Cobbler or other earlies.	August 1, outside. For new potatoes all winter. Ready in 3 months.	B	Hardy. Plant whole in rows 3 feet apart, 1 foot apart in row. Moist, light, rich soil. 8 bushels per acre.
Potato, Sweet. Yellow Yam or Georgia Yam.	Bed thickly in March. Transplant the sprouts outside May 1. Ready in 6 months.		Very deep sand. Rows 3 feet apart, 2 feet apart in row. 3 pounds to 100-foot row. Dig as wanted through the winter.
Radish. French Breakfast or Scarlet Turnip.	Oct. 1, outside. Oct. 15, outside. Nov. 1, outside. Cold-frames November 1 and every 10 days. Ready in 6 weeks.	C	Hardy. Plant ½ inch deep in rows 8 inches apart. 1 ounce to 100-foot row.
Salsify. Sandwich Island.	Outside, August 1 and September. (A difficult crop in the South). Ready in 5 months.	B	Hardy. Plant ¼ inch deep in rows 1½ feet apart, 4 inches apart in row. Water freely.
Spinach. Viroflay. New Zealand.	Sept. 1, outside. Oct. 1, outside. Nov. 1, outside. (doubtful crop). Sept. 1, cold-frame. (A sure abundant product all winter).	A-B-E	Almost hardy. Plant 1 inch deep in rows 1½ feet apart, 3 inches apart in row. 1 ounce for 150 feet.

PLANTING TABLE FOR GARDEN VEGETABLES—Continued

Especially Adapted to Southern United States

Name and Variety	Time to Plant	Class	How to Plant and Care for
Strawberries Lady Thompson or Hefflin or Hoffman.	Transplant every year in October. Ready in February or March.		Hardy. Rows 2 feet apart, 1 foot apart in rows. Rich, sandy loam. Mulch in summer. No stable manure. Confine to single crowns.
Tomato. Beauty or Perfection.	Aug. 15, greenhouse. Sept. 15, greenhouse. Oct. 15, greenhouse. Ready in 4 months.	B-A	Tender. Plant ½ inch deep, 1½ feet apart. 1 packet of seed enough. Pinch out tips at desired height. Pinch out all side shoots. Fertilize blossoms by hand.
Turnip. Early Milan.	October 1, outside. Ready in 2 to 3 months.	C	Hardy. Plant ½ inch deep in rows 1½ feet apart, 3 inches apart in row. 1 ounce for 200 feet. Moist and rich soil.

III. THE FRUIT TREES

The fruit trees are cultivated for the sake of their fruit. They bear either kernel fruit, when their seed kernels are enclosed in cores of parchment-like formation; or stone fruit, when the seed kernel is enclosed in a hard shell, which is in its turn enclosed in some succulent pulp; or shell fruit, when the fleshy interior is enclosed in a hard shell.

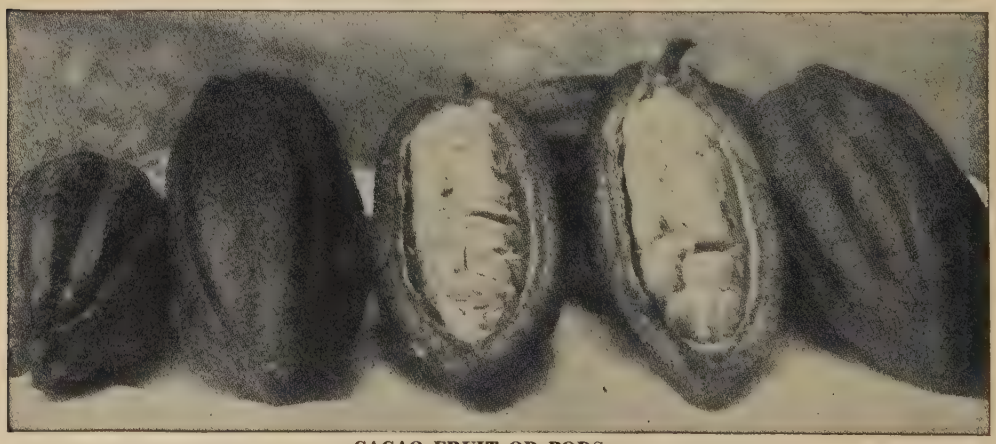
Almond, a small tree belonging to the rose family, native to northwest Africa. The flowers are solitary and generally pink, and appear before the lance-shaped leaves. The fruit is egg-shaped, downy externally, with a tough, fibrous covering and a wrinkled stone. It has long been widely cultivated, and many varieties exist, differing in the hardness of the stone and in the flavor of the seed. SWEET ALMONDS include the large thin-shelled Jordan (from the French *jardin*), the Valencia almond, imported as a dessert fruit from Malaga, the smaller Barbary and Italian forms, and the California product. The BITTER ALMOND yields an essential oil, employed in confectionery, but dangerous from sometimes containing prussic acid.

Apple (*Pyrus Malus*), grows wild in forests, but it is found artificially improved everywhere in gardens and orchards. Its bark is generally smooth; its wood somewhat soft; its leaves oval-shaped and about double the length of their stalks; its blossoms are white with reddish margins. Fruit horticulture has produced many species of apples in the course of time, and they are now the most important fruit of the temperate zone, area of production, consumption, and variety of product being considered, ranking with the grape, olive, orange, lemon and banana, among the six leading fruits of the world. North America is preëminently the leading apple growing region. In the United States, New York, Pennsylvania, and Ohio produce about one-third of the total crop.

The cultivation of the apple is prehistoric. Abundantly used by Lake Dwellers of the Stone Age in Italy and Switzerland.

Apricot (*Prunus Armeniaca*). The tree attains a height of thirteen to sixteen feet, and shows its blossoms in the months of March and April. Its smooth leaves are oval, doubly serrated; and its white blossoms have a tinge of red. Its globular, velvet-like, downy fruits are a favorite dish for dessert.

Apricots are extensively grown in north India, Persia, south Europe and Egypt. Although grown in New York, the crop is only commercially



CACAO FRUIT OR PODS

Each pod contains some sixty seeds, arranged in five or eight rows (mostly five); the seeds are white when they are fresh, but brown and covered with a fragile skin or shell when dried. These seeds, which are not unlike beans or almonds, are imbedded in a mass of mucilaginous pulp, of a sweet but acid taste. The seeds only require to be extracted, cured and dried, to become the cacao-beans of commerce.

HOW THE COCOA BEANS ARE DRIED AND ROASTED

Small crops of beans are spread out on the ground, or on a tray, or on a piece of matting, and dried in the sun. In other cases, artificial heat is used in specially constructed and equipped drying-houses.

The beans are roasted, similar to coffee, in large iron drums to increase the aroma, make them more soluable in water, and improve their flavor. After being ground, and mixed with sugar, the product becomes chocolate—and is used in many ways.

important in California and Oregon, whence large quantities of the fresh and dried fruit are shipped to the eastern states and abroad.

Cultivation in China antedates 2000 B. C. It was introduced into Europe at the time of Alexander the Great, about 325 B. C.

Bread-fruit (*Artocarpus incisa*), grows upon the islands of the Pacific Ocean, and has also been transplanted to those parts of America which lie in the Torrid Zone. It attains a very great height, and bears fruits weighing from three to four pounds. The latter are cut into slices, and after being dried and roasted are used as food. These fruits, when pounded and mixed with milk of the cocoanut, form a dough, which is either consumed raw or baked into bread. All parts of this tree are useful; its yellow wood is used for the construction of houses, from its fibres articles of clothing are made, and its sap is used for making birdlime. Its large leaves serve as tablecloths and napkins, and its blossoms when dried are an excellent tinder. The bread-fruit tree is therefore much cultivated.

Butternut (*Juglans cinerea*), a North American species of walnut. Its dark yellow wood takes a fine polish, and is used in cabinet work; the bark yields a brown dye, and the brown-husked, rugged nuts contain oil, and are very pleasant in flavor.

Cacao (*Theobroma cacao*), a small tree, native to Mexico, Central America and the north of South America, are cultivated also in Brazil, Guiana, Trinidad and Grenada. It has large, oblong, pointed, entire leaves and clusters of flowers with rose-colored calyx and yellowish petals. The fruit is yellow, from six to ten inches long, and from three to five broad, oblong, blunt, with ten longitudinal ridges externally, and five chambers, containing ten or twenty seeds each, internally. The thick, tough rind is almost woody. The seeds are dried, roasted, bruised, and winnowed, so as to remove their testa from the cocoa-nibs or cotyledons. These contain more than fifty per cent of fat or cocoa-butter, part of which is generally removed in the process of "preparing" cocoa. It is used in making chocolate "creams." Cocoa is also a valuable article of food; contains a gently stimulating alkaloid, theobromine, a fragrant essential oil and a red coloring matter. Sugar and vanilla or other flavoring are added in the preparation of chocolate.

Cherry (*Prunus avium*), is a stately tree of from twenty-five to forty-five feet in height. It has a pyramidal crown; its smooth bark splits crosswise; its leaves are elliptical, and covered with down on their lower sides; its blossoms are snowy white and its fruits sweet and of different colors. The latter furnish an agreeable nourishment, whether consumed raw, boiled, or preserved. Cherry-brandy is also made from them. The Cherry is cultivated in temperate regions of Europe, Asia, and the United States, and included among the fifteen leading fruits of the world. Ranks about eighth among fruits of the United States. Pennsylvania and California lead in production.

It was grown before the Christian Era in western Asia and southern Europe, and is mentioned in Vergil's *Georgics*.

Cinnamon (*Cinnamomum zeylanicum*), is largely grown in Ceylon. The bark is stripped off two-year-old shoots in May and November and dried in the sun, undergoing a slight fermentation. It rolls up into quills, the thinnest being the best. Cinnamon contains a fragrant essential oil and has long been valued as a spice. It has also some medicinal value as a cordial and stomachic. It is also cultivated for bark in Brazil, West Indies, Egypt, and Java, but cultivation is now declining in favor of coffee.

Clove (*Eugenia caryophyllata*) a small evergreen spice tree, native of the Moluccas. The fruits are imported as mother cloves, and the stalks are used to adulterate the spice when ground. The whole plant is aromatic from the presence of the essential oil of cloves, which occurs to the extent of sixteen to eighteen per cent in the flower-buds. The dried flower buds are the cloves of commerce. Cultivated on many tropical islands and coasts, chiefly in the Moluccas, Sumatra, Java, Mauritius, Zanzibar, Jamaica, and French Guiana. The oil of cloves widely used in flavoring and perfumery and also in medicine.

Cocoa-nut (*Cocos nucifera*), a small genus of palms. The cocoa-nut palm is apparently a native of the Indian Archipelago, but has been dispersed throughout the tropics from early times, flourishing especially near the sea. It has a cylindric stem reaching two feet in diameter, and from sixty to one hundred feet in height; a crown of pinnate leaves, each eighteen to twenty feet long, with a sheathing and fibrous base, succeeded by bunches of from ten to twenty fruits. These are about a foot long, six or eight inches across, three-sided, with a stony shell and one seed filling its cavity. The seed contains a fleshy kernel and a milky liquid. No tree of the tropics has so many uses, every part of it being employed, and in southern India furnishing several of the chief necessaries of life. The wood of the outer part of the stem is used, under the name of Porcupine wood, for inlaying; the leaves for thatch, mats, hats, etc.; the fibrous part under the name of coir, for cordage, etc.; the shell for bottles, cups, spoons, and when properly burned, for excellent charcoal and lamp-black. The solid white kernel contains thirty-six per cent of oil known as copra oil, from which, by pressure, the solid stearine used for candles is separated from the liquid lamp-oil. The "milk," when fresh, is an agreeable drink; and from the sap sugar is obtained, and, by fermentation, toddy, from which vinegar and by distillation, arrack are prepared. It is extensively cultivated on the coasts of India, the East and West India Islands, and Brazil, and recently in Florida.

Coffee Tree (*Coffea Arabica*), originally a native of Africa attains a height of twenty-five to thirty feet. It is generally, however, kept at a much inferior height, in order to facilitate the collection of the fruit. Its leaves are evergreen; its blossoms white and fragrant. The fruit is a red berry about the size of a cherry, which contains two kernels, lying closely side by side: the coffee beans. These coffee beans are used everywhere for the preparation of that coffee which has become an indispensable beverage for many millions of people. Commercially it is of great importance, being largely grown in Brazil, Mexico, Central America, West Indies, Arabia, Java, Sumatra, Ceylon, India, and Hawaii. Brazil leads with a production of over one-half of the world's crop. In the United States the consumption greatly exceeds that of tea.

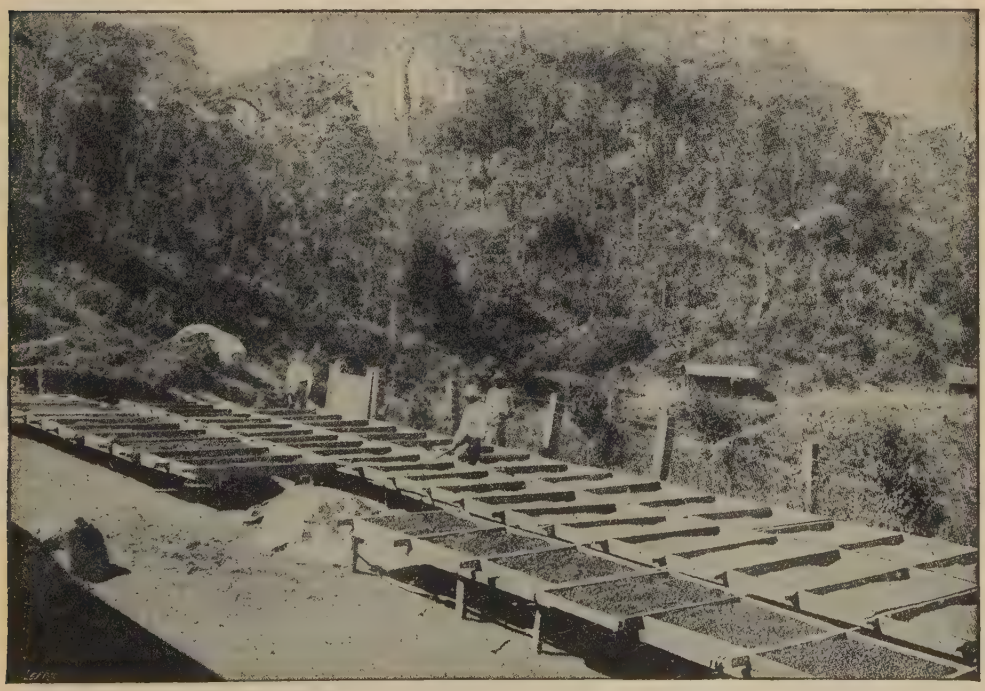
Beginning of its cultivation is uncertain, but not ancient. It was introduced for cultivation in South America by the Dutch in 1718.

Date or Date-Palm (*Phœnix dactylifera*), a tree sixty to eighty feet high, with large pinnate leaves, cultivated in immense quantities in north Africa, western Asia and southern Europe. The stem is covered with leaf scars, and the flowers each have three sepals and three petals. The wood of the stem is used in building; huts are built of its leaves; the petioles are made into baskets and the fibre surrounding their bases into ropes and coarse cloth; the young leaf-bud or "cabbage" is sometimes eaten as a vegetable, or, if tapped, it yields a sugary sap which may be fermented; and even the seeds are ground into meal for camels. In central Arabia and some parts of north Africa the fruit forms the

SCENES IN THE PRODUCTION OF THE COFFEE BERRY

THE COFFEE PLANT IN FLOWER

FROM FLOWER TO RIPE "CHERRIES"



METHOD OF DRYING COFFEE ON WOODEN TRAYS IN THE OPEN AIR, AS STILL PRACTICED IN ARABIA AND OTHER ORIENTAL COUNTRIES

WOMEN OF JAVA HULLING COFFEE

The "cherries" when gathered contain two seeds, or coffee beans. The coverings are removed from the seeds by "hulling."

SIZING, OR SORTING THE COFFEE BEANS FOR THE MARKET BY PASSING THEM THROUGH SIEVES MESHES

staple food of the inhabitants, camels, horses, and dogs. It is the chief source of wealth in Arabia. It was very anciently cultivated in Egypt and Babylonia and is the *palm* of the Bible.

Fig (*Ficus Carica*). The common fig is a native of the East. It is a low deciduous tree or shrub (fifteen to twenty-five feet), with large, deeply-lobed leaves, which are rough above and downy beneath. The branches are clothed with short hairs, and the bark is greenish. The fruit is produced singly in the axils of the leaves, is pear-shaped, and has a very short stalk; the color in some varieties is bluish-black; in others, red, purple, yellow, green or white. The fig is extensively cultivated in subtropical countries, particularly in Spain, Italy, and southern France, in Europe, and in southwestern Asia. It is also grown in the Gulf States and in California. All dried figs in the United States are produced in California. Commercial figs come largely from Asiatic Turkey, though Smyrna figs are now established in California.

Grape-fruit or Shaddock (*Citrus decumanus*), a tree, which, like the other species of the same genus, is a native of the East Indies, and has long been cultivated in the south of Europe. It is readily distinguished by its large leaves and broad-winged leaf-stalk; it has very large white flowers, and the fruit is also very large, sometimes weighing ten or even fourteen pounds, roundish, pale yellow; the rind thick, white, and spongy within, bitter; the pulp greenish and watery, subacid and subaromatic. It is a pleasant, cooling fruit, and much used for preserves. Finer and smaller than the shaddock proper is the Pomelo (also called Pummelo, and grape-fruit) a variety rather larger than an orange which bears its fruit in clusters. It was anciently cultivated and much prized fruit in India, China, East Indies and Pacific Islands. Now successfully established in Florida and California, and rapidly becoming popular table fruit in the United States.

Lemon (*Citrus Limonum*), a small tree or shrub closely related to the orange, apparently truly indigenous in the north of India, carried to Palestine and Egypt by the Arabs, and to Italy by the Crusaders, and now naturalized in the West Indies and elsewhere. The fruit is oval, and ends in a nipple-like point; the rind is thin, smooth, and not readily separable; and the juice is acid. There are numerous varieties, including the citron, bergamot, lime, and sweet lime. Cultivation in the United States is limited mostly to Southern California.

Lime (*Citrus acida*), is a variety of orange with small flowers, and small, very acid, fruit, varying in form but ending, like the lemon, in a nipple-like boss. It is said to have been anciently cultivated in India, from whence it has been widely diffused in tropical countries. It is widely imported in temperate regions, but sparingly used, being much less popular than the lemon. Now successfully grown in Florida, which produces a small crop.

Mango (*Mangifera indica*), a small tree indigenous to tropical Asia, but now cultivated throughout the tropics. It has scattered, entire leaves and small pink or yellow flowers. Though its glossy leaves make it valuable for shade, it is chiefly valued for its fruit, which varies considerably in size and flavor. In an unripe state it is used in pickles; but in India is largely eaten when ripe as a dessert fruit. The seeds, bark and resin have some medicinal value, apparently as astringents, and the wood, though soft, is used as timber.

Maté or Paraguay Tea (*Ilex paraguayensis*), a species of holly growing in Paraguay and south Brazil, which furnishes the chief non-alcoholic drink of South America. Though used immemorially by the Indians, the tree was first cultivated by the Jesuits. The dried leaves are packed in scrons or raw hides containing about two hundred pounds each. The infusion is prepared in a calabash or maté, usually silver-mounted, boiling water and sugar, with milk or lemon-juice, being added to the leaves (yerba), and the beverage taken very hot through a metal or reed tube or bombilla with a strainer at one end. Maté contains 1.85 per cent of caffein, acting as a restorative, much as tea does; but, being bitter, the taste for it has to be acquired.

Mulberry (*Morus*), allied to the nettle, hemp, and elm families. The BLACK MULBERRY, mainly cultivated for its fruit, is perhaps a native of Armenia, but was early introduced into Greece, where its leaves are still used for feeding silkworms. The Asiatic species, or the WHITE MULBERRY, of which there are numerous varieties, mostly with white fruit, is that mainly cultivated in Japan, China, India and Italy for the silkworm. The fibrous inner bark of the PAPER MULBERRY is made into paper by the Chinese and Japanese, and into tapa cloth in the South Sea Islands. The so-called fruit is formed from a whole cluster of flowers which becomes fleshy, turn color and sweeten while they enlarge until they meet those of the other flowers, enclosing the true fruits, small dry capsules. Extensively grown for market near large cities in Europe and the United States.

Nutmeg (*Myristica fragrans*), an evergreen tree native to the East Indies, and now in cultivation in the East and West Indies and Brazil. The fruit is pear-shaped and about two inches across. The seed has a thin, hard shell enclosing the nutmeg, which is mottled in appearance. The largest and roundest nutmegs are the best, and though generally about one hundred and ten to the pound, they may be as few as sixty-eight. Nutmegs contain about twenty-five per cent of nutmeg butter or oil of mace, a vegetable fat now considerably employed in soap-making.

Olive (*Olea europæa*), a very valuable small tree, seldom more than thirty feet high, of slow growth, but sometimes exceeding twenty feet in girth and seven centuries in age. The wild olive has squarish, spinous branches; opposite evergreen, leathery, shortly-stalked leaves, hoary on their under surface, and small white flowers. The cultivated olive (var. *sativa*) differs in its rounder branches which have no spines, longer leaves and larger fruit. For pickling, the fruits are gathered unripe, soaked in an alkaline lye, and then bottled in brine. For oil, the ripe fruit, which usually yields sixty to seventy per cent, is squeezed, yielding virgin oil, and the marc or cake is wetted and re-pressed, and the kernels crushed and boiled to yield a second and third quality. The tree grows best on light or calcareous soils near the sea, and the value attached to its oil as an article of food in countries where butter can with difficulty be preserved made the tree from early times the symbol of peace and good-will. It is extensively cultivated in Mediterranean Europe, Syria, South Africa, Australia and California.

Orange (*Citrus Aurantium*), small evergreen trees, probably a native of southern China and Burma, but grows wild and spinous in Indian jungles. The scattered glossy leaves are remarkable for their double articulation, having one joint at each end of the winged leaf-stalk. The fragrant white or pinkish flowers have five sepals, five petals, and branched stamens. The fruit has a leathery rind, containing large spindle-shaped cells filled with watery juice. As the fruit takes some months to ripen, it occurs on the tree at the same time as the next year's blossoms. There are two chief varieties or sub-species, the sweet or China orange, and the bitter, bigarade or Seville orange, but the Mandarin and Tangerine oranges are sometimes ranked as a distinct species. The principal orange-growing sections

of the United States are Florida, Louisiana and California.

The MANDARIN ORANGE or CLOVE ORANGE has fruit much broader than long, with a rind very loosely attached to the flesh, and small leaves; the TANGERINE ORANGE is apparently derived from the mandarin. It is grown in Florida. The JAFFA ORANGE has now a great reputation. The MAJORCA ORANGE is seedless. The KUM-QUAT from China and Japan, is little bigger than a gooseberry, and grows well in Australia. The NAVEL ORANGE, nearly seedless, is a favorite variety with California growers.

Orange trees are often extremely fruitful, so that a tree twenty feet high and occupying a space of little more than twelve feet in diameter sometimes yields from three thousand to four thousand oranges in a year. One tree in Florida has often borne ten thousand oranges in a single season. The orange tree attains an age of at least one hundred to one hundred and fifty years. Young trees are less productive than old ones, and the fruit is also less juicy, has a thicker rind, and more numerous seeds.

Palms were called by Linnæus "the princess of the vegetable kingdom," and comprising over one thousand species, chiefly natives of the tropics. They have mostly cylindric, unbranched stems, bearing a tuft of large, often gigantic, leathery leaves at the top, the leaves being torn into segments. The leaves are sometimes scattered, and in most cases have a fibrous sheathing base to the leaf-stalk. The terminal leaf-bud is the "cabbage" which, in some species, is eaten. The fruit varies very much, with a hard seed, as in the date; drupaceous, as in the cocoa-nut; or covered with woody reflexed scales, as in the sago palm. The use of palms are innumerable. Beams, veneers, canes, thatch, fibre for cordage and matting, fans, hats, bowls, spoons, sago, sugar, wine, spirits, food, oil and wax are only some among the number. See also DATE, BETEL-NUT, COCOA-NUT.

Peach (*Amygdalus persica*), probably a native of China. The nectarine is merely a smooth-fruited variety, differing, however, in flavor. The stone in both is coarsely furrowed. The flowers which appear before the leaves, are of a delicate pink. The fruit in the peach has a separable wooly skin. Though deliciously flavored and refreshing, since it contains eighty-five per cent of water and eight per cent of pectose and gum, it does not contain much nutriment. Peaches grow extensively in Europe and Asia and second only to the apple as an orchard fruit in the United States. California, Michigan, Georgia and Texas lead in production.

Pear (*Pyrus communis*), is a tree belonging to the same genus as the apple. It grows from thirty to seventy feet high, with a pyramidal outline; branches spinous in the wild state; leaves scattered and somewhat leathery; flowers in clusters; fruit with a fleshily-enlarged stalk, core near the apex and parchment-like, and black seeds. Gritty particles, due to groups of wood-cells, occur in the flesh. They are widely cultivated in temperate regions, but chiefly in France and the United States. Ranks fourth among American orchard fruits, being preceded by the apple, peach and plum. Chiefly grown in California, New York and Michigan.

Pecan (*C. illinoensis*), is a large, slender tree reaching a maximum height of one hundred and seventy feet and a diameter of six feet. It grows in moist soil, especially along streams, from Indiana to Iowa and Missouri, south to Kentucky and Texas. It is cultivated in the Southern States for its sweet, edible nut, which forms an important article of commerce.

Persimmon, the Virginian date-plum (*Dios pyros virginiana*), a moderately-sized tree of the United States, belonging to the ebony tribe, the round orange fruit of which, though austere, becomes edible when affected by frost. They are fermented into a beer and distilled for spirit in the Southern States. The bark has medicinal properties.

Plum (*Prunus domestica*), a small fruit-tree, native to Asia Minor and the Caucasus, and naturalized in most temperate parts of the world. The Damson or Damascus variety was grown by the Romans from very early times. Large quantities of many varieties, both home and foreign are grown, which are eaten raw, in tarts, and in preserves, or, when dried as *prunes*. Extensive cultivation is carried on throughout temperate regions. Third most important orchard fruit in the United States, exceeding eight million bushels, California growing two-thirds. All prunes produced in the United States grown in the Pacific States; first prune orchard planted at San Jose, California, in 1870.

Pomegranate (*Punica Granatum*), long valued in hot countries for the refreshing pulp of its fruit. It is a tree, fifteen to twenty-five feet in height, native to West Asia and North Africa. It has opposite, simple, entire leaves, and the flower has five scarlet or white petals. The fruit has a tough, leathery gold-colored, but partly reddened, exterior and numerous seeds each surrounded by a reddish pulp. This varies in flavor in the numerous cultivated varieties. The rind is rich in tannin, and is employed in tanning Morocco leather.

Walnut (*Juglans regia*), or COMMON WALNUT is a native of Persia and the Himalayas, but has long been cultivated in all parts of the south of Europe. It is a tree of sixty to ninety feet, with large spreading branches. The leaves have two to four pairs of leaflets, and a terminal one. The ripe fruit is one of the best of nuts. It yields a bland fixed oil, which, under the names of walnut oil and nut oil, is much used by painters as a drying oil. The timber of the walnut is of great value, and is much used by cabinet-makers. The wood of the roots is beautifully veined. Both the root and the husks of the walnut yield a dye, which is used for staining light-colored woods brown. Very similar to the common walnut, but more valuable, is the BLACK WALNUT of North America, found in most parts of the United States, except the most northern. See also BUTTERNUT.

IV. FRUIT-BEARING SHRUBS AND PLANTS

The trees previously mentioned are woody plants with only one stem, which begin to form branches at some distance from the ground. The shrubs, on the contrary, are woody plants in which the stem forms branches close to the ground, or even underground.

Banana (*Musa sapientium*), a handsome plant, long cultivated in tropical and sub-tropical countries for its fruit. The sheathing bases of the large, oblong leaves form a false stem twenty to thirty feet high. The spikes of irregular flowers are succeeded by a branch of one hundred to two hundred fruits, weighing together from fifty to eighty pounds. The long, berry-like fruits, as they ripen, convert nearly all their starch into sugar and pectose, and form a valuable

The banana plant is the most wonderfully productive fruit in the world. It is a native of Asia, but most of our bananas come from the New World. Here the plant is full grown and the bananas ripe. From the time the suckers are planted to the gathering of the fruit is less than a year, so rapidly does the plant come to maturity.

article of food, the staple food in many tropical countries, producing forty-four times the weight of food per acre yielded by the potato. It is produced in enormous quantities in the West Indies and Brazil, and shipped in constantly increasing volume to the United States and Europe. Beginning with a few hundred bunches in 1870, consumption in the United States has increased to upwards of five million dollars worth annually. Banana flour is becoming a staple article of food.

Its cultivation antedates historical records in India. Pliny mentions that the Greeks under Alexander the Great saw it in India.

Blueberry. See Huckleberry.

Cassava (*Manihot utilissima*), the bitter cassava, and *M. Aipi*, the sweet cassava, are both natives of tropical America. Both are shrubby plants, the former with yellow poisonous roots and seven-lobed leaves, the latter with reddish wholesome roots and five-lobed leaves. The coarsely-grated roots are baked into cassava cakes, from which the intoxicating drink piwarrie is prepared. The juice of the poisonous kind is rendered harmless by boiling, and is then the delicious sauce known as cassareep. If allowed to settle, it deposits a large quantity of starch, known as Brazilian arrowroot when simply sun-dried, or as tapioca when partly converted into dextrine by roasting on hot plates. It was long cultivated in Brazil, and, after Spanish discovery, extended to Africa and Asia.

Cranberry (*Oxycoccus*), a small evergreen shrub, that grows in bogs and marshy grounds, and is a small wiry shrub with creeping, thread-like branches, and small oval leaves rolled back at the edges. The berries are an excellent anti-scorbutic, and hence furnish an excellent addition to sea stores. The American cranberry (*O. macrocarpa*) is larger and more upright with bigger leaves and berries. Large quantities are exported to Europe and other varieties are also imported into Britain and Germany from Russia and other parts of northern Europe.

Currant (*Ribesrubrum*), is an important shrub, bearing red, black and white fruit. Its branches are not prickly; its leaves have three to five lobes, greenish-yellow blossoms and the berries

The method of gathering bananas is practically the same wherever they are grown, and here we see the bunches being brought to the railway. Bananas need a great deal of water. They will only grow in a warm, damp atmosphere and if much rain does not fall they must be supplied with water artificially. This is done by having canals between the rows of plants.

hang in clusters like grapes. It is often planted in gardens for the sake of its fruit, but is also found in a wild state. Black currants are extensively grown in Continental Europe, Scotland and Canada; sparingly in the United States. In France the *liqueur de cassis* is made from the fruit. Red currants are very widely grown in Europe and the United States, chiefly for jellies. New York and Michigan lead in production.

Elder (*Sambucus*) has thorny branches, elliptical, serrated leaves and single, white blossoms which grow in such numbers that they sometimes resemble snow. Its fruit is black and blue. It grows from three to six feet high in copses, hedges and forests. Few of the species are considered of much value though *S. Canadensis* is used to make a domestic wine and jelly. The most ornamental of the species is *S. pubens*, which has large, loose panicles of bright scarlet berries. This species is occasionally found in moist high grounds from New York southward. It is very abundant and beautiful on the slopes of the Alleghany Mountains.

Gooseberry (*Ribes Grossularia*) has branches covered with spines, brown-reddish blossoms and berries of green, yellow or reddish color, which stand singly on the young shoots. It is frequently planted in gardens, and has many varieties. It is highly prized in northwestern Europe; not cultivated in southern Europe, and reaches highest perfection in England. In the United States, while widely grown, is of minor importance, ranking sixth among small fruits, being preceded by the strawberry, raspberry, blackberry, cranberry and currant.

Grape (*Vitis Labrusca*) has a climbing, knotty trunk, which sometimes attains a length of thirty to fifty feet; its leaves have from three to five lobes, and are coarsely serrated; its small, fragrant, greenish blossoms stand in panicles. The fruit of many varieties of vine, which have been produced by cultivation in the coarse of thousands of years is very different in color, size and flavor. It is either consumed raw and dried, or manufactured into wine.

In the United States the first vineyard was planted by Lord Delaware in 1610, but not extensively grown until after the introduction of the Concord grape during the last century. While the Concord, Catawba, Isabella, Hartford

and most of the cultivated varieties originated from the wild northern fox or plum grape, *Vitis Labrusca*, the Clinton grape was derived from the wild species, *Vitis riparia*, and most of the American wine grapes from the native summer grape, *Vitis aestivalis*.

Since 1860 grape culture has made remarkable progress, the last census showing a crop exceeding eight million dollars in value. New York produces one-third of the American grape crop and is followed by Ohio, Pennsylvania, Michigan, Illinois, Indiana, Missouri and Kansas, in order named. Notwithstanding the extensive culture of the European grape in the Pacific States, the American grape constitutes three-fifths in value of all grape products of the United States. Millions of young vines have been shipped to Europe to be top grafted with the European vine.

The grape shares leading rank with the apple among the world fruits. Chief products: raisins, currants and wine of great commercial importance. Raisin production largest in Spain, but important in southwestern Asia, Australia and California. *Currants* are small, seedless raisins, mostly grown in Greece (name derived from Corinth). Wine is made throughout the world, total production estimated at four billion gallons, France, Italy and Spain contributing about three-fourths of this enormous amount. The European grape products of California—wine, raisins and table grapes,—amount in value to two-fifths of all grape products of the United States.

Remotely ancient in Egypt. Used by Lake Dwellers of the Bronze Age in Italy. Cultivated by the Phoenicians, Hebrews, Greeks and Romans. Introduced into China 120 B. C.

Huckleberry. The popular name of the genus *Gaylussacia*, of which there are several species. The *Dwarf* huckleberry, the *Blue* huckleberry and the *Black* huckleberry are common throughout the United States, the latter being the huckleberry of the Northern States. In New England the name is commonly restricted to the black berry species in distinction from the blue berry. The shrubs range in height from about three feet to twelve feet high. In New England canning huckleberries is an extensive if not exceedingly profitable industry. The crop is first picked by hand and afterwards with a "blueberry rake." The Indians long ago gathered the fruit and dried it for use during wintertime.

Pepper Plant (*Piper nigrum*) is found all over the Torrid Zone. Its berries stand to the number of twenty to thirty on one spike; at first they are green, then they turn red, and finally black. The black pepper is prepared from the unripe fruit, the white from the ripe fruit, which loses its black shell by being put into salt water (sea water). Pepper is now the most commonly and widely used spice. It is extensively cultivated in East and West Indies, Siam and Malay Peninsula, whence millions of pounds are exported.

Cayenne pepper, or chili is much grown in tropical Africa and America, but less generally used than black pepper.

Pistacia is a small tree, about twenty feet high, and native to Persia and Syria, but now cultivated in all parts of southern Europe and northern Africa. Flowers in racemes, fruit ovate and about the size of an olive. Pistachio nuts are much esteemed; but readily become rancid. Oil is expressed from them for culinary and other uses.

Pine-apple (*Ananassa sativa*) is highly esteemed and much cultivated for its fruit. It has a number of long, serrated or smooth-edged,

A PINE-APPLE PLANTATION IN FLORIDA

A TEA PLANTATION IN THE BEAUTIFUL HILL COUNTRY OF CEYLON

The most productive tea gardens are at an elevation of about one thousand feet, the land at this altitude being generally of an undulating character, well watered, and the climate sufficiently humid to encourage leaf-production.

The plants are ready for plucking when three years old, at which time they send out numerous leaf-shoots, known as "flush." The plucking season begins in September and lasts until June of the following year, during which period each bush is plucked about sixteen times.

sharp-pointed, rigid leaves, springing from the root, in the midst of which a short flower-stem is thrown up, bearing a single spike of flowers, and therefore a single fruit. From the summit of the fruit springs a crown or tuft of small leaves; capable of becoming a new plant; the pine-apple, in cultivation, being propagated entirely by crowns and suckers, as, in a state of high cultivation, perfect seed is almost never produced. The pine-apple is a native of tropical America, and is found wild in sandy maritime districts in certain parts of South America, but has been very much changed by cultivation. It is extensively grown in Florida, and in the West Indies for shipment to northern markets and to Europe. Increasing outdoor plantations have also been developed in the Azores, the Hawaiian Islands, northern Africa, Queensland, and the Bahamas. Florida supports upward of fourteen million plants. Great care is requisite in the cultivation of the pine-apple, which without it is generally fibrous and coarse, with little sweetness or flavor, and with it one of the most delicate and richly flavored of fruits.

For producing superior fruit in winter the Smooth Cayenne and Black Jamaica are two of the best and most reliable, and the Queen is the most highly esteemed for summer fruiting. The Spanish is the variety commonly grown in Florida. A spirituous liquor (Pine-Apple Rum) is made from the pine-apple in some warm countries.

Raspberry (*Rubus Idæus*), the most valued of all the species of Rubus. The wild raspberry has scarlet fruit and is found in thickets and woods throughout the whole of Europe and northern Asia. It was early introduced into the United States, but those now grown originated in native American varieties. The black raspberry, is largely grown in New York and Ohio as a commercial industry. The red variety is widely grown in the United States, but production is small compared to that of the black raspberry. Among the more promising varieties of the blacks are Gregg, Ohio and Kansas. Cuthbert is one of the best of the red varieties. The raspberry has long been in cultivation for its fruit. The root is creeping, perennial; the stems only biennial, bearing fruit in the second year, woody, but with very large pith. The raspberry is the leading bush fruit of the United States and second only to the strawberry among small fruits. New York, Michigan, Ohio and Pennsylvania, ranking in the order named, grow over one-half of the total crop, which exceeds seventy-five million quarts. The berries are consumed raw or in a preserved state, or are manufactured into raspberry juice, wine and cordial.

Tea (*Camellia theifera*) is a plant of which there are two well-known varieties: (1) Assam tea; and (2) China tea. The Assam variety, known as "indigenous" tea, is a tree of vigorous growth attaining a height of thirty to forty feet with a leaf from eight to ten inches in length. The China variety is a comparatively stunted shrub, growing to a height of twelve to fifteen feet, with a rounder leaf about three and one-half inches in length, and calyx covered with soft, short hairs. These two varieties have resulted in a hybrid which combines the hardy character of the China with the other features of the indigenous, now largely cultivated on the hills of India and Ceylon, and known as "hybrid-Assam." The hybrids vary much in productiveness.

The tea-plant will flourish in all parts of the tropical and subtropical zones where the rainfall is over sixty inches and evenly distributed throughout the year. In Ceylon it grows from sea-level to an altitude of seven thousand feet.

The tea-plant is not particular as to soil, but it succeeds best on new forest-land containing plenty of humus. As is the case with cacao, coffee and other economic plants, tea grown on rich, alluvial soil is stronger than tea grown on poorer land, though the latter is often of more delicate flavor.

Chinese teas may be classified thus: Monings, or black leaf teas are grown in the north of China, and shipped from Hankow and Shanghai. Green teas are shipped from Shanghai and consist of Gunpowder, Imperial, Hyson, Young Hyson and Twankay. Kaisows or Red-leafs are grown farther south and are shipped from Foo Chow.

The United States and Canada consume nearly all the tea exported from Japan, all of which is of light character, consisting mostly of Oolongs and greens. Tea has been grown with success in South Carolina and experimentally elsewhere in the United States.

MANUFACTURE.—The first process is to spread the green leaf thinly on hessian trays in the withering house, where it is exposed to a free current of air—a very important operation, which takes from twelve to forty-eight hours. When the leaf is tough and flaccid, like an old kid glove, it is ready for rolling. The old or Chinese system of rolling was by hand. Now this process is performed by machinery, and in India and Ceylon tea is not manipulated after plucking. The rolled leaf is now ready for fermentation, an operation requiring close attention. It is placed in drawers or on tables and covered. The state of the weather hastens or retards the process; in hot, dry weather the leaf will be sufficiently fermented or oxidized in twenty minutes, in cold wet weather it may take hours. Whenever the leaf assumes a bright copper color it must be fired; over-fermentation is a fatal error.

The difference between black and green teas is simply this: if the tea is fired immediately after rolling it is green tea; if it is fermented it becomes black tea. After firing the manufacture is complete, and the tea is what is known as "unassorted," which contains all the different grades into which tea is usually separated. Sorting by hand sieves is still done in small factories, but in large factories machinery is used.

V. FLOWERS AND OTHER ORNAMENTAL PLANTS

We cultivate in our gardens plants of all kinds, which give us great pleasure on account of their lovely blossoms or their agreeable odors. They are no longer luxuries, but have become necessities of life; and never have they become so extensively grown and widely appreciated as now. There are plants suited for sunny and shaded aspects and for various positions, from the mossy dell to high and dry situations in the country; from the area to the housetop in the town. Only knowledge is wanted for making the best selections for different purposes and sites, with information on culture for the uninitiated to achieve satisfactory results.

Plants and flowers grown in gardens are embraced in three groups: 1. ANNUALS, 2. BIENNIALS, and 3. PERENNIALS, the last-named being divided into two sections:

(*a*) *herbaceous*, with soft or succulent stems that die in the winter; and (*b*) *shrubby* perennials with woody stems that survive the winter.

ANNUALS are those flowers which are born, grow, flower, ripen seeds, and die within a year. They never push growths a second season after flowering, because the roots die as well as the tops and branches. The common scarlet Poppy is a typical example.

BIENNIALS are those plants which are raised from seeds in the spring or early summer and require the whole season to make their growth preparatory to flowering the next year, dying after ripening seeds.

PERENNIALS differ from the above in living more than two years. All plants, such as hardy border flowers, that die down and spring up again from the root-stock year after year are perennials—herbaceous. Roses and other flowering shrubs are also perennials, but not herbaceous. *Orchids.* One of the best examples of herbaceous perennials is that of the Orchids, the most popular of which are the Odontoglossums and the Cattleyas.

FLORIST'S FLOWERS. This term has been applied to a number of plants which under cultivation and by selection or hybridization have produced from seed varieties of improved form, habit or color. The plants included under this title are constantly being added to, and great impetus given to the cultivation of hardy flowers and plants in recent years. The following are representative of this class:

Begonia. Named in honor of M. Begon, a French patron of botany. All the species of Begonia are interesting and beautiful winter ornaments of the hot-house or green-house, of the simplest culture in any rich soil if allowed an abundant supply of water. There are several tuberous-rooted species and varieties. They have large, showy flowers, and succeed well in a moist, shady border. The tubers should be kept warm and dry during the winter. They are readily propagated by cuttings, seeds, or division of tubers.

Carnation (*Dianthus caryophyllus*) is an almost hardy herbaceous perennial plant, a native of southern Europe. The Greeks and Romans used it for making chaplets whence it was called "coronation." It is a favorite exhibition flower, of many varieties, forms and colors; but the red, white, pink and yellow predominate. Carnations are among the plants which can be grown in the atmosphere of cities, but they are intolerant of shade. Propagation is usually effected by the process of layering, but cutting, seeds, and divisions are also employed.

Cattleya. What the rose and carnation are among garden plants, the Cattleya is among Orchids, preëminently beautiful. Not a species but possesses claims of the strongest nature on the culturist's attention, either for its delicate loveliness or the rich and vivid coloring of its large and handsome flowers. They are natives of the temperate parts of South America, and in cultivation are found to succeed in a lower temperature than is necessary for the majority of plants of the same order. The plants grow vigorously, and consequently flower in perfection. The colors of the flowers run through all the shades of white, rose, rosy-lilac, crimson and carmine, nor is even yellow absent.

Dahlia. This, through constant improvement, has become one of the indispensable flowers. It derived its name from the Swedish botanist Dahl. Dahlias are known as show, fancy, pompon, single and cactus. They vary from the single type, not unlike a daisy, with broad rays, to the tiny, tightly-quilled, formal "pompon," and to the "cactus-flowered," resembling a chrysanthemum; and their lines are equally varied. Yellow, lilac, white and the deepest maroon, are found in innumerable combinations. It is necessary to lift the roots in late autumn, and, having ripened them in a shed, to store them for the winter in a cool, dry place, where the temperature will not fall below thirty-two degrees Fahrenheit. In the spring, the separate tubers may be planted in deep, rich soil; or the roots may be placed in February in a hot-bed, and when the young shoots which form are about three and a half inches long, they may be separated, together with a small piece of the tuber, and potted in small pots, which should be placed in the hot-bed until the young plants are ready to be hardened, preparatory to being planted outdoors.

Geranium. Our native species, called "crane's bill," from the beak-like appearance of the fruit, have palmately lobed or cleft leaves. The flowers have unusually bright-colored petals. The plants commonly cultivated in gardens and greenhouses under the name of Geraniums are species of Pelargonium. There are about one hundred and twenty-five species, mostly natives of the Cape of Good Hope, prized on account of the brilliant colors, of the flowers and the shape and markings of the leaves.

The most popular method of propagating is by cuttings, which can be rooted in pots or boxes of light soil placed in a greenhouse, or even a cottage window, at any time from spring to autumn, provided the soil is not kept very moist. Good loam is the best potting material, and beyond a little sand it needs no addition. Firm potting is a point to be well observed. Avoid coddling.

Gloxinia is the florists' name for plants belonging to the genus *Sinningia*, tropical American plants. They have beautiful, many-colored, funnel-shaped flowers and velvety leaves. Seeds should be sown in February; and if the young plants are carefully potted, they flower the first year. They require the temperature of a warm greenhouse during the summer months; but as the leaves die away in autumn, the roots may be stored in a dry place, merely protected from cold. They like a sandy soil, containing abundance of leaf-mould and heat.

Lily (*Lilium*) in its many forms is one of the noblest and must beautiful of all bulbous plants. About forty-five species are natives of the north temperate zone, many of which are prized for the size and beauty of the flowers. The WHITE LILY (*L. candidum*), a native of the Levant, with large white flowers, has long been in cultivation in gardens. The EUROPEAN ORANGE LILY (*L. bulbiferum*), with large, orange-colored flowers,

PROUD COLOR BEAUTIES OF THE LAND OF FLOWERS

1. ANTIRRHINUM. 2. THE ODONTOGLOSSUM. 3. POPPIES. 4. GLOXINIA. 5. CORNFLOWERS. 6. NASTURTIUMS. 7. THE CATTLEYA FORBIA. 8. FOXGLOVE.

is a well-known and very showy ornament in flower gardens. The TIGER LILY (*L. tigrinum*) has a stout stem two to five feet high with beautiful orange-colored flowers, spotted with purple. It is a native of China but has escaped from cultivation in many parts of the United States.

Nasturtium, the generic name of a plant of the *cruciferæ* or mustard family, and the common name of the widely different genus *tropæolum*. The best known of these is *Tropæolum tricolorum*, one of the must generally cultivated annuals. It has tuberous roots, and such very weak and slender stems, that it is found necessary always to train them over a wire frame, as they are quite unable to support themselves. The stem climbs six or eight feet; the flowers vary from yellow to orange, scarlet and crimson. The unexpanded flower buds, and the young fruit while still tender, are pickled in vinegar. The dwarf varieties of this form bushy, rounded tufts about a foot high, and are used for bedding; some of them have flowers of exceedingly rich colors.

Odontoglossum. Unquestionably the most popular genus of Orchids. Very many of the species have been introduced into the green-house, and are greatly prized by cultivators for their magnificent flowers, which are remarkable both for their size and the beauty of their colors. Many of the species have pure white flowers, variously mottled; and some have a powerful odor of violets. With but few exceptions, they require to be grown in a moderately cool house. They are propagated by division, and grown like the other varieties of Orchids.

Tulip (*Tulipa*). A genus of upward of eighty species of hardy bulbous plants. Between forty and fifty species are known, mostly natives of the warmer parts of Asia. The most famous of all florists' flowers is the garden tulip (*T. gesneriana*), which is from eighteen inches to two feet high, with a smooth stem, bearing one erect, large flower. The tulip is still most sedulously cultivated in Holland, especially at Haarlem, whence bulbs are largely exported; but attention is almost exclusively devoted to the cheaper varieties, which are used in hundreds of thousands for the purposes of decoration in gardens and rooms throughout winter and spring. Tulips are propagated by offset bulbs, and new varieties are raised from seed. Another species of tulip cultivated in gardens is the sweet-scented tulip, or Van Thol tulip (*T. suaveolens*), which has yellow or red flowers, inferior to those of the common garden tulip in beauty, but prized for their fragrance, and for appearing more early in the season.

ROSES AND ROSE CULTURE

Roses are perhaps the most universally admired of all flowers, and few respond so well to the care of the cultivator. The earlier they are planted in the autumn (October 15th to November 15th) the better they will grow. Spring planting is fairly successful, provided the roots are kept moist when out of the ground. Time, April 15th to May 15th.

Roses enjoy deeply worked and fertile soil, and may be grown in specially prepared beds, or as borders. An open position, with a south or southeast exposure is preferable. Pruning should be done toward the end of March. When especially large blooms are desired, only one should be borne on each stem, the remainder of the buds being removed.

DESIRABLE VARIETIES FOR THE ROSE GARDEN

HYBRID PERPETUALS.—These produce handsome blooms in varied colors in the summer followed by a more or less bountiful supply in the autumn. Hardiest of the garden roses.

Varieties:

Frau Karl Druschki.—An ideal white rose.
Jacqueminot (Jack Rose).—Brilliant scarlet.
Paul Neyron.—Dark rose; largest of all.
Magna Charta.—Bright pink; a favorite.
George Arends.—Splendid soft pink.

HYBRID TEAS.—These possess the freedom of growth of the foregoing with much of the delicacy of flowers for which Tea-scented Roses are admired. The most satisfactory for the general garden.

Varieties:

Robert Huey.—One of the largest bright reds.
The Lyon.—Deep coral pink verging on yellow.
White Killarney.—One of the best pure whites.
La France.—Clear, satiny pink.
Burbank.—Rich pink.
Richmond.—Brilliant crimson.

TEA AND NOISETTES.—Loveliness with profuseness are combined in this section. Much tenderer than the Hybrid Teas; sweet scented. The Noisette is an excellent climber for walls.

Varieties:

The Bride.—Pure white.
Perle des Jardins.—Beautiful rich yellow.
Papa Goutier.—Dark crimson.
William Allen Richardson.—Deep orange-yellow flowers.
Garland.—Semi-double, blush and white.
Longworth Rambler.—Splendid autumn climber; flowers, semi-double and crimson.

HARDY CLIMBERS.—Popular and showy.

Varieties:

American Pillar.—Large, single, pink flowers.
Excelsa.—Finest of crimson ramblers.
Hiawatha.—Single, brilliant crimson.
Dorothy Perkins.—Soft shell-pink, fragrant.
Lady Gay.—Delicate cerise-pink which change to creamy white.
Wichmoss.—A "Moss" rose, light bluish-pink, fragrant.

HYBRID BRIERS.—Hardy semi-climbing roses.

Varieties:

Lord Penzance.—Beautiful contrasting shades.
Refulgence.—Dazzling scarlet, in clusters.
Juliet.—Rosy red with reverse petals of old gold.

THE "BABY RAMBLERS."—Dwarf, "perpetual bloomers."

Varieties.

Phyllis.—Beautiful pink.
Jessie.—Bright cherry-red, white center.
Orleans.—Brilliant red, white center.
Snowball.—White, free flowering.

JAPANESE AND CHINESE.—

Varieties.

Blairii (China).—Vigorous climber for sunny walls; flowers, blush and rose.
Rugosa (Japanese).—No pruning is needed; flowers, white, rose and violet.

GUIDE FOR THE BEST ANNUAL FLOWERS

Common and Botanical Name; Hints on Cultivation	Color, Height and Time in Bloom	Kind of Soil and Light Required
BLOOMING IN MAY		
Pansies (*Viola tricolor*), generally wintered in frames, but protected with leaves often survive the winter outdoors.	Various; 7 inches; 8 weeks.	Rich, light; partial shade.
Trailing Catchfly (*Silene pendula*).—For succession from May 15th to July 15th sow outdoors September 1st, and again in early spring.	Pink, white; 12 inches; 4 weeks.	Light, rich loam; sun.
Cornflower (*Centaurea Cyanus*).—With moisture and frequent picking will bloom longer.	Blue; 24 inches; 10 weeks.	Light; sun.
Calliopsis (*Coreopsis tinctoria*).—*Calliopsis elegans* is one of the best browns among flowers.	Yellow and brown; 24 inches; 12 weeks.	Light; sun.
BLOOMING IN JUNE		
Giant Spider Plant (*Cleome spinosa*).—Usually planted in the front of shrubbery.	Rosy purple; 36 inches; 4 inches.	Light; sun.
Ageratum (*Ageratum conyzoides*).—Sow seed under glass in March. For edging.	Blue; 8 inches; 16 weeks.	Rich, light; sun or half shade.
Annual Phlox (*Phlox Drummondi*).—Remove fading flowers daily.	Various; 12 inches; 12 weeks.	Rich, moist; sun.
Monkey Flower (*Minulus luteus*).—Spotted petals. Flowers somewhat resemble a snapdragon.	Various; 36 inches; 6 weeks.	Rich, moist; shade.
Three-colored Gilia (*Gilia tricolor*).—A profuse bloomer. Sow seeds where plants are to grow by May 1st, and it will bloom in late June.	Various; 24 inches; 8 weeks.	Any good; sun.
Shirley Poppy (*Papaver Rhœas*).—A form of the common corn poppy. Sow seeds in the poppy bed in early September or April.	Various; 24 inches; 2 weeks.	Good, moisture; sun.
Sweet Pea (*Lathyrus odoratus*).—Manure and moisture cause abundance of blossoms. Sow seed March 20th near New York. Cut flowers daily.	Various; 72 inches; 8 weeks.	Heavy, rich loam; sun.
Candytuft (*Iberis umbellata*).—Sow early where plants are to stand.	Various; 8 inches; 4 weeks.	Good; sun.
Petunia (*Petunia hybrida*).—Grow somewhat apart from low plants because straggling.	White, pink; 12 inches; 16 weeks.	Good; sun.
Western Wallflower (*Erysimum asperum*).—For May bloom sow in September, for June flowers sow in April.	Orange; 18 inches; 4 weeks.	Dry; sun.
Antirrhinum or Snapdragon (*Antirrhinum majus*).—Sow in hotbed in February for June bloom.	Various; 24 inches; 12 weeks.	Rich, moist; sun.
BLOOMING IN JULY		
Lavatera (*Lavatera tri*).—Sow early May where plants are to grow.	Pink, white; 24 inches; 5 weeks.	Light, rich; sun.
Clarkia nerifolia (*Clarkia elegans*).—*Clarkia pulchella* is also useful for edging beds.	White, lilac pink; 24 inches; 6 weeks.	Light, rich; sun or half shade.
Large-flowered Godetia (*Œnothera Whitneyi*).—The large-flowered species. Some with spotted throats.	White, lilac, pink; 12 inches; 6 weeks.	Good; sun.
Early Cosmos (*Cosmos binnatus*).—Very rich soil makes it bloom too late.	White, pink, crimson; 48 inches; 8 weeks.	Light; sun.
Sweet Alyssum (*Alyssum maritimum*).—Blooms till frost. Trim back moderately when flowers fade.	White; 8 inches; 14 weeks.	Light; sun.
Nicotiana affinis (*Nicotiana alata*).—Very fragrant at night. Plants usually started in cold frame.	White; 36 inches; 12 weeks.	Light; sun or part shade.
Sander's Nicotiana (*Nicotiana Sanderæ*).—More satisfactory as a greenhouse plant, steadily improving.	Various; 36 inches; 12 weeks.	Light, rich; sun or part shade.
Arctotis grandis (*Arctotis grandis*).—Petals white above, lilac beneath. Blue-centered daisy.	White and lilac; 18 inches; 14 weeks.	Light, rich; sun.
Stock, Gilliflower (*Matthiola incana*, var. *annua*).—For July bloom sow February in greenhouse or hotbed.	Various; 18 inches; 12 weeks.	Deep, rich; sun.
Annual Larkspur (*Delphinium Ajacis*).—Sow seeds in September outdoors to have flowers July 1st.	Various; 18 inches; 8 weeks.	Good, light; sun.
Bedding Lobelia (*Lobelia Erinus*).—Blooms till frost in partial shade if watered.	Blue; 10 inches; 12 weeks.	Light, rich, moist; half shade.
Wishbone Flower (*Torenia Fournieri*).—Set five inches apart in two or three lines.	Blue; 8 inches; 12 weeks.	Light, rich, moist; half shade.
Phacelia congesta (*Phacelia congesta*).—An interesting little plant for border edge.	Blue; 12 inches; 6 weeks.	Light, rich; sun.
African Marigold (*Tagetes erecta*).—Colors range from deep orange to sulphur yellow.	Yellow; 36 inches; 16 weeks.	Rich; sun.
California Poppy (*Eschscholzia Californica*).—Sow early in border edge. Avoid transplanting.	Yellow; 15 inches; 16 weeks.	Rich; sun.
Giant Tulip (*Hunnemannia fumariæfolia*).—Bushy in habit. Sow seeds in May outdoors.	Yellow, red; 24 inches 8 weeks.	Rich; sun.

GUIDE FOR THE BEST ANNUAL FLOWERS—Continued

Common and Botanical Name; Hints on Cultivation	Color, Height and Time in Bloom	Kind of Soil and Light Required
Annual Gaillardia (*Gaillardia pulchella*).—Best kinds belong to var. *picta*. Profuse bloomer.	Crimson, red, yellow; 24 inches; 14 weeks.	Rich, light; sun.
Salvia or Scarlet Sage (*Salvia splendens*).—Don't place near pink flowers. Start indoors in March.	Red; 36 inches; 14 weeks.	Good; sun or half shade.
Youth and Old Age (*Zinnia elegans*).—Rather stiff, but splendid for mass effects in garden.	Various; 36 inches; 14 weeks.	Rich; sun.
Rose Moss (*Portulaca grandiflora*).—Sow outdoors June 1st. It self-sows freely.	Various; 6 inches; 14 weeks.	Light, sun.
Balsam (*Impatiens Balsamina*).—*Balsamina hortensis* strain is best. Pinch plants once.	Various; 24 inches; 6 weeks.	Light, rich, moist; sun.
Painted Tongue (*Salpiglossis nuata*).—Beautiful venation. Best started under glass.	Various; 18 inches; 8 weeks.	Rich, light; sun.
Verbena.—Sow indoors in February to get earliest bloom.	Various; 12 inches; 10 weeks.	Rich, light, moist; sun.
BLOOMING IN AUGUST		
Three-Colored Chrysanthemum (*Chrysanthemum carinatum*).—Sometimes called "painted daisy."	Various; 24 inches; 8 weeks.	Rich, light; sun.
Mourning Bride (*Scabiosa atropurpurea*).—Sown in April for early August bloom.	Various; 24 inches; 8 weeks.	Rich, light; sun.
China Asters (*Callistephus Chinensis*).—Dig in wood ashes around roots to prevent diseases.	Various; 24 inches; 6 weeks.	Rich, light; sun.
Everlasting (*Helichrysum bracteatum*).—This shade is by far the most desirable.	Deep red; 36 inches; 8 weeks.	Light, rich; sun.
Didiscus (*Trachymene cærulea*).—Sow *Didiscus cæruleus* under glass in April.	Light blue; 24 inches; 8 weeks.	Rich, light; sun.
BLOOMING IN SEPTEMBER		
China Aster (*Callistephus hortensis*).—Dig in wood ashes to prevent aster disease.	Various; 24 inches; 4 weeks.	Light, rich; sun.
Cosmos (*Cosmos bipinnatus*).—Dig around it and jolt it in midsummer.	Pink, white and red; 6 inches; 2 weeks.	Fairly good; sun.
BLOOMING IN OCTOBER		
Autumn Crocus (*Colhicum autumnale*).—They begin to bloom in September.	Purple, white, pink; 4 inches; 4 weeks.	Rich, light; sun.
Datsch's Aster (*Aster Datschi*).—Latest aster of its color in trade.	White; 36 inches; 3 weeks.	Good, deep; sun.
Himalayan Aster (*Aster trinervis*).—Latest aster of its color in trade.	Violet-purple; 30 inches; 3 weeks.	Good, deep sun.
Tea Rose (*Rosa Chinensis*).—Last bloom of the monthly or tea rose.	Various; 24 inches; 2 weeks.	Rich, deep; sun.
Perennial Larkspur (*Delphinium sp.*).—Cut back larkspur after annual bloom.	Blue; 24 inches; 2 weeks.	Deep, rich; sun.
Everbloom Torch Lily (*Kniphofia Pfitzerii*).—Store roots of *Tritoma Pfitzerii* in cellar over winter.	Orange-scarlet; 36 inches; 6 weeks.	Rich, deep; sun.
BLOOMING IN NOVEMBER		
Pompon Chrysanthemum (*Chrysanthemum Indicum*).—Buttons one-half inch across or flowers one inch across.	Various; 36 inches; 4 weeks.	Rich, loam; sun.

GUIDE FOR THE BEST PERENNIAL FLOWERS

Common and Botanical Name; Hints on Cultivation	Color, Height and Time in Bloom	Kind of Soil and Light Required
BLOOMING IN MARCH		
Anemone or Hepatica (*Hepatica triloba*).—For wild garden or rock garden. Evergreen.	Blue, lilac, pink, white; 5 inches; 3 weeks.	Rich, drained loam; shade.
BLOOMING IN APRIL		
Bluebell (*Mertensia Virginica*). Leave undisturbed for years. Foliage dies in summer.	Blue; 16 inches; 3 weeks.	Rich loam; sun.
Shooting Star (*Dodecatheon Meadia*).—Its English name is very descriptive.	Pink; 8 inches; 3 weeks.	Good; partial shade.
Wild Sweet William (*Phlox divaricata*).—The tallest of the early phloxes.	Blue; 16 inches; 4 weeks.	Rich; sun or shade.
Sweet Violet (*Viola adorata*).—Blooms again in autumn.	Blue; 8 inches; 6 weeks.	Heavy rich; sun or shade.
Rock Cress (*Arabis albida*).—For edgings, carpeting bare spots, covering banks, etc.	White; 4 inches; 3 weeks.	Any; sun.
Large-Leaved Saxifrage (*Saxifraga sp.*).—The different species known to the trade as *Saxifraga Megasea* generally appear in early April.	White, blue, pink; 12 inches; 2 weeks.	Any; partial shade.

GUIDE FOR THE BEST PERENNIAL FLOWERS—Continued

Common and Botanical Name; Hints on Cultivation	Color, Height and Time in Bloom	Kind of Soil and Light Required
Moss Pink (*Phlox subulata*).—Spreads rapidly. Moss-like foliage. Carpets ground.	Pink; 6 inches; 4 weeks.	Good; full sun.
English Primrose (*Primula vulgaris*).—Some moisture is necessary to produce fine blossoms.	Yellow; 9 inches; 3 weeks.	Light rich; full sun.
Leopard's Bane (*Doronicum plantagineum*, var. *excelsum*).—Showiest early flower of the daisy family. Flowers sometimes four inches across. Give scattering bloom all season.	Yellow; 10 inches; 4 weeks.	Any; sun or semi-shade.
Poppy Mallow (*Callirhoe involucrata*).—Hardy: May bloom again in late summer.	Red, purple; 9 inches; 8 weeks.	Good sun.
BLOOMING IN MAY		
Spiderwort (*Tradescantia Virginiana*).—For mixed borders, wild garden or front of shrubbery.	Violet, blue; 24 inches; 12 weeks.	Good; sun or half shade.
Many-Leaved Lupine (*Lupinus polyphyllus*).—Easily raised from seed. Soil must not dry quickly.	Blue, white; 36 inches; 4 weeks.	Rich, heavy; sun or shade.
Common Columbine (*Aquilegia vulgaris*).—Also grow *A. chrysantha* (yellow), and *A. Canadensis* (red).	Violet, white; 36 inches; 5 weeks.	Rich; sun or shade.
German Iris (*Iris Germanica*).—Plant rhizomes flat, cover half their depth. Best transplanted after bloom. Keep from contact with manure.	Various; 24 inches; 3 weeks.	Good; sun.
Scotch Pink (*Dianthus plumarius*).—Evergreen. Don't cover with litter in winter.	White, pink; 10 inches; 2 weeks.	Good; sun.
Garden Heliotrope (*Valeriana officinalis*).—Sweet spicy fragrance; rapid spreader; an old favorite.	White; 36 inches; 3 weeks.	Good; sun or half shade.
Yellow Larkspur (*Delphinium nudicaule*).—Grows wild near streams in northern California, a pretty, early variety for the garden.	Yellow; 12 inches; 10 weeks.	Deep, rich, sandy loam; sun.
Brown and Yellow Corn Flower (*Lepachys columnaris*, var. *pulcherrima*).—Grown as an annual for bedding. Start indoors in March; it will bloom June to September.	Brown and yellow; 24 inches; 12 weeks.	Any good; sun.
Lily-of-the-Valley (*Convallaria majalis*).—Divide every four or five years if crowded. Plant six or seven pips in a bunch.	White; 8 inches; 3 weeks.	Good, heavy; partial shade.
Bachelor's Button (*Ranunculus acris*, var. *flore pleno*). —Easiest to raise of the yellow buttons.	Yellow; 18 inches; 5 weeks.	Good, moist; partial shade.
Cowslip (*Primula officinalis*).—Small flowers well above leaves. Water during drought.	Yellow; 8 inches; 3 weeks.	Moist, deep, light; part shade.
Lemon Lily (*Hemerocallis flava*).—This sweet scented flower is the best Hemerocallis.	Yellow; 18 inches; 4 weeks.	Good; sun or partial shade.
Early Peony (*Pœonie officinalis*).—This European species is the parent of the early peonies; blooms fortnight before the Chinese peonies.	Red, white; 6 inches; 8 weeks.	Rich, heavy; sun.
Carolina Phlox (*Phlox cvata*).—A rich color for the front of a bed.	Rosy red; 8 inches; 4 weeks.	Good, light; sun.
Bleeding Heart (*Dicentra spectabilis*).—Commonly planted in fall. Sold by bulb dealers also.	Rosy red; 18 inches; 4 weeks.	Rich, light; sun.
Pyrethrum (*Chrysanthemum coccineum*).—*Pyrethrum roseum* dies from too much moisture in clay soil. Wilts if too dry.	Pink, white; 24 inches; 5 weeks.	Rich, deep, light; sun.
English Daisy (*Bellis perennis*).—Best to winter in cold frames. Water freely while growing.	Pink, white; 6 inches; 8 weeks.	Rich, rather heavy; sun.
Siberian Primrose (*Primula cortusoides*).—One of the latest primroses. Flowers one inch across.	Pink; 12 inches; 5 weeks.	Dry, rich; sun.
BLOOMING IN JUNE		
Perennial Larkspur (*Delphinium formosum*).—*D. Zalil* is yellow, two feet. *D. elatum* is blue, six feet. *D. Chinensis* is a dwarf kind, two feet.	Blue; 24 inches; 6 weeks.	Rich, well-drained heavy; sun.
Canterbury Bells (*Campanula Medium*).—Biennial, needs winter protection. Var. *calycanthema* best.	Blue, white, pink; 24 inches; 5 weeks.	Rich, not too light; sun.
Foxglove (*Digitalis purpurea*).—Short-lived perennial but self-sows. Highest type is var. *gloxiniæflora*, best sown in August; wintered in cold frames.	Purple; 36 inches; 5 weeks.	Light, good, moist; sun; shade.
Beard-Tongue (*Pentstemon diffusus*).—Tall slender spikes of light purplish blue flower.	Blue; 24 inches; 3 weeks.	Good soil; partial shade.
Japanese Iris (*Iris lævigata*).—Largest flowered iris. Needs more moisture.	Various; 48 inches; 4 weeks.	Rich, moist; sun.
Siberian Columbine (*Aquilegia Sibirica*).—Give columbine seeds light soil; plants rather heavy soil.	Light blue; 24 inches; 4 weeks.	Rich, dry; sun or half shade.
False Indigo (*Baptisia australis*).—Resembles the lupine.	Blue; 36 inches; 3 weeks.	Good; sun.
Douglas' Clematis (*Clematis Douglasi*).—Bell-shaped flowers darker within than without.	Blue; 24 inches; 3 weeks.	Rich, light loam; sun.

GUIDE FOR THE BEST PERENNIAL FLOWERS—Continued

Common and Botanical Name; Hints on Cultivation	Color, Height and Time in Bloom	Kind of Soil and Light Required
Jacob's Ladder (*Polemonium cœruleum*).—Likes moisture. An old-time flower.	Blue, white; 24 inches; 4 weeks.	Rich, deep loam; sun.
Amsonia (*Amsonia Tabernæmontana*).—Subshrub with willow-like leaves. Grows well in shrubbery.	Blue; 24 inches; 4 weeks.	Good; sun.
Goat's Beard (*Aruncus astilboides*).—Feathery-spiked flowers. Fine cut foliage.	White; 24 inches; 3 weeks.	Good; sun.
Pearl Achillea (*Achillea Ptarmica*, var. *Pearl*).—Fence in roots with a square of boards.	White; 24 inches; 12 weeks.	Rich; sun.
Phlox Miss Lingard (*Phlox maculata*, var. *Miss Lingard*).—Healthiest and best variety of common early perennial garden phlox.	White; 18 inches; 6 weeks.	Rich; sun.
Gas Plant (*Dictamnus Fraxinella*).—Will also grow in partial shade. Very long-lived.	White, pink; 24 inches;	Rich, heavy; sun.
Hardy Yucca (*Yucca flaccida*).—"*Yucca filamentosa*" of nurserymen, not of botanists. Transplant only in early spring. Makes new plants every year by suckers.	White; 60 inches; 4 weeks.	Rich, light loam, sun.
Golden Marguerite (*Anthemis tinctoria*).—Divide every year. Var. *Kelwayi* best.	Yellow; 12 inches; 10 weeks.	Good; sun.
Perennial Coreopsis (*Coreopsis lanceolata*).—Don't let it go to seed.	Yellow; 18 inches; 10 weeks.	Good; sun.
Woolly Yarrow (*Achillea tomentosa*).—Carpets the ground in early June.	Yellow; 8 inches; 4 weeks.	Dry, rich; sun.
Perennial Gaillardia (*Gaillardia aristata*).—The yellow with maroon disk is perhaps the best. Blooms steadily till frost if fading flowers are cut.	Yellow; 12 inches; 16 weeks.	Good, light; sun.
Thin-Leaved Coneflower (*Rudbeckia triloba*).—Biennial, but blooms first year and self-sows.	Yellow; 36 inches; 5 weeks.	Rich, moist; sun.
Wild Indigo (*Baptaisi tinctoria*).—*Baptisia australis*, blue, is showier.	Yellow; 24 inches; 4 weeks.	Good; sun.
German Catchfly (*Lychnis Viscaria*).—Beautiful, old-fashioned, long-lived in congenial situation.	Deep red; 9 inches; 3 weeks.	Good, light; sun.
Late or Chinese Peony (*Pœonia Chinensis*).—Flowers best in rather heavy soil, with moisture in spring and summer. Single varieties are exquisite.	Crimson, white, pink; 30 inches; 3 weeks.	Very rich, deep; sun.
Oriental Poppy (*Papaver orientale*).—The variety *bracteatum*—deep red—is the best.	Red; 36 inches; 2 weeks.	Rich; sun.
Sweet William (*Dianthus barbatus*).—Biennial but self-sows.	Various; 12 inches; 5 weeks.	Light, rich; sun.
Japanese Pinks (*Dianthus Chinensis*, var. *Heddewigi*). Best treated as annual. Start indoors.	Various; 9 inches; 12 weeks.	Light, rich; sun.
Coral Bells (*Heuchera sanguinea*).—Graceful racemes of delicate flowers. Blooms all summer.	Crimson; 18 inches; 12 weeks.	Good; sun or half-shade.
Fire Pink (*Silene Virginica*).—It cannot stand much moisture.	Crimson; 18 inches; 8 weeks.	Good; sun or half shade.
BLOOMING IN JULY		
Fremont's Clematis (*Clematis Fremonti*).—A western bush clematis for the hardy border.	Bluish purple; 24 inches; 3 weeks.	Deep, rich; sun.
Beard-Tongue (*Pentstemon ovatus*).—Short-lived but very free blooming while it lasts.	Blue; 36 inches; 3 weeks.	Moist; sun.
True Monkshood (*Aconitum Napellus*).—This plant lives longer in partial shade.	Blue; 48 inches; 3 weeks.	Rich, partial shade.
Japanese Bellflower (*Platycodon grandiflorum*).—Largest easily grown flower of the bellflower family.	Blue, white; 18 inches; 4 weeks.	Light loam; sun.
Double Feverfew (*Chrysanthemum Partheniun*).—Gives many white buttons.	White; 18 inches; 12 weeks.	Rich; sun.
False Chamomile (*Beltonia asteroides*).—Like a wild aster. Very profuse of bloom.	White, violet; 60 inches; 4 weeks.	Any good; sun.
Bugbane (*Cimicifuga racemosa*).—For shrubbery back of border, or wild garden.	White; 60 inches; 4 weeks.	Good; partial shade.
Meadow Rue (*Thalictrum polygamum*).—For wild garden or shrubbery. Fern-like foliage.	White; 60 inches; 4 weeks.	Moist; sun.
Perennial Phlox (*Phlox paniculata*).—See also *Phlox maculata* in June.	White, pink, red, blue; 36 inches; 4 weeks.	Rich, moist; sun.
Hollyhock (*Althœa rosea*).—Dig dry Bordeaux about crowns in spring; spray under side of leaves weekly with ammoniacal copper carbonate.	White, pink, red; 72 inches; 4 weeks.	Deep, rich, heavy; sun.
Double Perennial Sunflower (*Helianthus decapetalus*, var. *multiflorus*).—Divide every two years. Flowers deteriorate.	Yellow; 60 inches; 6 weeks.	Any good; sun.
Shining-Leaved Coneflower (*Rudbeckia nitida*).—Plenty of moisture suits it best.	Yellow; 24 inches; 4 weeks.	Any good; sun.
Golden Glow (*Rudbeckia laciniata, fl.* pf.).—Wonderfully prolific. Divide annually. Getting common.	Yellow; 72 inches; 3 weeks.	Any good; sun.
Pitcher's Sunflower (*Heliopsis lævis*).—Earlier than sunflowers, smaller. Var. *Pitcheriana* best.	Yellow; 6 weeks.	Good, dry; sun.

GUIDE FOR THE BEST PERENNIAL FLOWERS—Continued

Common and Botanical Name; Hints on Cultivation	Color, Height and Time in Bloom	Kind of Soil and Light Required
Gay Feather (*Liatris pycnostachya*).—Very striking. Plant in groups of five or more.	Pink; 48 inches; 3 weeks.	Good; sun.
Purple Coneflower (*Echinacea purpurea*).—Rather coarse but effective flowers. Sometimes four feet high.	Pinkish; 24 inches; 6 weeks.	Good; deep; sun.
Bee Balm (*Monarda didyma*).—Rapid spreading. Place next to white phlox.	Red; 36 inches; 8 weeks.	Good; sun.
BLOOMING IN AUGUST		
Long-Leaved Veronica (*Veronica longifolia*).—The best is var. *subsesilis*.	Blue; 36 inches; 3 weeks.	Deep, rich; sun.
Stoke's Aster (*Stokesia cyanea*).—Hardy near Boston. An unusually fine shade of blue.	Blue; 18 inches; 4 weeks.	Well drained, light, rich; sun.
Mist Flower (*Conoclinium cœlesitnum*).—Easily grown. Light blue color.	Blue; 18 inches; 4 weeks.	Any good; sun.
Joe-Pye Weed (*Eupatorium purpureum*).—For back of broad border, or shrubbery.	Purple; 96 inches; 4 weeks.	Any good; sun.
Arkansas Ironweed (*Veronia Arkansana*).—Flowers by August 1st. For shrubbery or wild garden.	Purple; 96 inches; 6 weeks.	Rich, deep; sun.
New York Ironweed (*Vernonia Noveboracensis*).—Bushy. May be placed near *V. Arkansana*.	Purple; 60 inches; 6 weeks.	Rich, deep; sun.
Lyon's Turtlehead (*Chelone Lyonii*).—Resembles pentstemons. Don't allow suffer from drought.	Purplish; 24 inches; 4 weeks.	Rich; partial shade.
Baby's Breath (*Gypsophila paniculata*).—Beautiful misty white flower. Effective in bouquets.	White; 24 inches; 3 weeks.	Rich, light; sun.
Marshmallow (*Hibiscus Moscheutos*).—They have deep crimson or purple eyes.	Rose, white; 60 inches; 3 weeks.	Rich; sun.
Showy Coneflower (*Rudbeckia speciosa*).—Moisture will increase the size of the flower.	Yellow; 24 inches; 6 weeks.	Good, sun or half shade.
Showy Sunflower (*Helianthus lætiflorus*).—Spread too rapidly for a crowded border.	Yellow; 72 inches; 6 weeks.	Good; sun.
Long-headed Coneflower (*Lepachys columnaris*).—Resembles black-eyed Susan.	Yellow; 24 inches; 6 weeks.	Good; sun.
Canadian Goldenrods (*Solidago Canadensis*).—Goldenrods all welcome in the wild garden.	Yellow; 48 inches; 5 weeks.	Any good; sun.
Yarrow, Milfoil (*Achillea Millefolium*).—Pink kind is var. *roseum*. Sink boards around it.	Pinkish; 24 inches; 8 weeks.	Any good dry; sun.
Butterfly Weed (*Asclepias tuberosa*).—Has big woody root. Transplant young seedlings.	Orange; 24 inches; 5 weeks.	Good, dry; sun.
Cardinal Flower (*Lobelia cardinalis*).—Does well in garden soil. Water freely.	Red; 36 inches; 5 weeks.	Deep, moist; partial shade.
Showy Stonecrop (*Sedum spectabile*).—Give good drainage. Best of the tall stonecrops.	Pink; 18 inches; 6 weeks.	Good, rich; sun.
False Chamomile (*Boltonia latisquama*).—Satisfactory for back of border. Spreads considerably.	Pinkish; 60 inches; 5 weeks.	Rich, deep; sun.
BLOOMING IN SEPTEMBER		
Fischer's Aconite (*Aconitum Fischeri*).—Early frost does not harm this beautiful flower.	Blue; 60 inches; 4 weeks.	Rich, deep, partial shade.
Blazing Star (*Liatris graminifolia*).—A singular and strikingly beautiful flower.	Rosy, purple; 36 inches; 3 weeks.	Rich, good; sun.
Tartarian Aster (*Aster Tataricus*).—Tallest of all asters. Many other good blue kinds.	Blue; 72 inches; 3 weeks.	Any good; sun.
New England Aster (*Aster Novæ Angliæ*).—The rose variety is better.	Purple; 48 inches; 3 weeks.	Any good; sun.
Giant Daisy (*Chrysanthemum uliginosum*).—Spreads rapidly. For back of borders. Rather heavy soil.	White; 60 inches; 3 weeks.	Rich, moist; sun.
Graceful Sunflower (*Helianthus orgyalis*).—One of the best hardy sunflowers. Blooms late.	Yellow; 96 inches; 4 weeks.	Any good; sun.
Maximilian's Sunflower (*Helianthus Maximiliana*).—Another graceful sunflower.	Yellow; 72 inches; 5 weeks.	Any good; sun.
Sneezeweed (*Helenium autumnale*).—Begins to bloom in August, sometimes in July.	Yellow; 60 inches; 8 weeks.	Any good; sun.

DESIRABLE ANNUAL VINES

Common and Botanical Name; Hints on Cultivation	Color, Height and Time in Bloom	Kind of Soil and Light Required
Hyacinth Bean (*Dolichos Lablab*).—Sensitive to frost. Makes good screen. Plant one foot apart.	Purple; 15 feet; 4 weeks.	Rich, light; sun.
Cup and Saucer Vine (*Cobæa scandens*).—Rapid climber. Set plants six inches apart.	Purplish, white; 15 feet; 6 weeks.	Rich, light; sun.
Allegheny Vine (*Adlumia cirrhosa*).—For covering bushes. Set eight inches apart.	Pinkish; 10 feet; 3 weeks.	Moist, rich; shade.

DESIRABLE ANNUAL VINES—Continued

Common and Btoanical Name; Hints on Cultivation	Color, Height and Time in Bloom	Kind of Soil and Light Required
Ivy-Leaved Gourd (*Coccinea cordifolia*).—*Coccinea Indica* is grown for its scarlet fruit.	White; 10 feet; 4 weeks.	Light, rich; sun.
Canary-Bird Vine (*Tropæolum Canariense*).—Not showy, but quick growing. Set eight inches apart.	Canary yellow; 15 feet; 3 weeks.	Light, rich; sun.
Balloon Vine (*Cardiospermum Halicabum*).—Seed vessels like balloons. Set plants ten inches apart.	White; 10 feet; 3 weeks.	Light, rich; sun.
Balsam Pear (*Momordica Charantia*).—Plant seeds outdoors after last frost, else under glass earlier.	Yellow; 10 feet; 3 weeks.	Light, rich; sun.
Climbing Nasturtium (*Tropæolum majus*).—For close screen plant ten inches apart.	Yellow or red; 10 feet; 8 weeks.	Light, rich; sun.
Cypress Vine (*Ipomœa Quamoclit*).—Star-shaped flowers. Finely cut leaves.	Scarlet; 15 feet; 3 weeks.	Light, rich; sun.
Scarlet Runner Bean (*Phaseolus multiflorus*).—Tender perennial with tuberous roots.	Red, white; 18 feet; 4 weeks.	Light, rich; sun.
Maurandia (*Maurandia Barclaina*).—Showy leaves and trumpet-shaped flowers.	White, blue; 10 feet; 2 weeks.	Light, rich; sun.

FLOWERING SHRUBS AND HEDGE PLANTS

Names and Descriptions	Height in Feet	Flowering Time	Cultivation and Use
Spirea (*Spiraea Van Houtter*).—The most showy of the spireas; flowers in umbels two inches across. Handsome foliage all summer.	6	June	Plant in a conspicuous place with ample room. Cut out flowering wood in summer. Thrives anywhere.
Spirea (*Spiraea, Anthony Waterer*).—The only shrub of its season. Flowers crimson red produced successively for six weeks. Good for edging.	3	July	Prune off old flower heads as soon as withered to induce good second crop.
Mock Orange (*Philadelphus coronarius*).—Most fragrant white large flowered shrub. Valuable for tall screen. Flowers one and one-half inches across.	12	June	Old wood should be cut out from time to time, otherwise the tree gets very ragged.
Althea or Rose of Sharon (*Hibiscus Syriacus*). The only tall shrub of late summer. Very hardy; leafs late. White or rose flowers.	12	August	Good for hedges and screens. Must be planted very early in the autumn.
Hydrangea (*Hydrangea paniculata*, var. *grandiflora*).—Most showy of all summer shrubs. White flowers, shading into pink and persisting all winter.	6 to 15	July-August	Prune very completely in winter for quantity of flowers next year.
Golden Bell (*Forsythia suspensa*).—The most showy, early-flowering shrub. Yellow flowers before the leaves. Branches arch over and root at tips.	5 to 8	April-May	Plant against a dark background, such as evergreens, or a hillside to set off flowers.
Japan Quince (*Cydonia Japonica*).—Earliest bright scarlet flowered shrub. Useful also as a hedge. Plant as specimen. Slow growing.	4 to 8	May	Very subject to San Jose scale Don't plant near orchards unless systematically sprayed. Stands close pruning.
Lilac (*Syringa vulgaris*).—Very fragrant lilac, white or purple flowers. Grows anywhere, even in partial shade.	8 to 15	May-June	Spray with potassium sulphide for mildew in August, September. Do not permit suckers to develop. Prune for form only.
Japanese Snowball (*Viburnum plicatum*). Largest showy white balls of bloom, better habit than the common snowball and not so subject to plant louse.	6 to 8	May-June	Prune as little as possible. Should be planted on lawn as a specimen, or trained on wall of house.
Tartarian Honeysuckle (*Lonicera Tatarica*).—Most fragrant of all the early summer shrubs, especially at dusk. Flowers pink; several varieties red or white.	8 to 10	May-June	Plant in shrubbery where its presence is made known by the odor. Valuable as a low screen on seaside.
Weigela (*Diervilla florida*).—Showiest shrub of midsummer. Flowers pink, white, red. Best flowering shrub under big trees.	6 to 8	June	Can be planted where other shrubs fail. Free from insects and disease. Cut out old wood to the ground.
Wistaria or Wisteria (*W. Frutescens*).—Handsome, hardy, slow-growing, climbing shrub. Flowers in elegant lilac-colored racemes, slightly scented.	8 to 15	All Summer	Adapted for screen or trellis.
California Privet (*Ligustrum ovalifolium*).—Fastest growing. Stands salt spray. Good soil binder. Stands severest pruning and can be trained high or low.	6 to 8		Set six inches deeper than in the nursery and cut back to six inches or less.

FLOWERING SHRUBS AND HEDGE PLANTS—Continued

Name and Description	Height in Feet	Flowering Time	Cultivation and Use
Regel's Privet (*Ligustrum Ibota*, var. *Regelianum*).—Low growing, denser habit with spreading, drooping branches clothed with white tassels.	2 to 6	June	Useful as a border hedge to plantations and along roadways. Should not be planted as a protection.
Osage Orange (*Maclura pomifera*).—Grows in any soil. Makes a dense defensive hedge as far north as Massachusetts. Flowers white.	3 to 15	May	Unless regularly trimmed, the top branches will spread. Will exhaust soil on each side for some feet.
Japanese Barberry (*Berberis Thunbergii*).—Foliage down to the ground. Dense compact growth of small spiny branches making effective hedge in winter.	4	June	Does not need pruning. Red berries all winter, and foliage red until Christmas. Do not plant in wheat districts.
Honey Locust (*Gleditschia triacanthos*).—The thorniest of all. "Bull strong, horse high and pig tight." Perfectly hardy. Fast and vigorous grower. Suckers.	3 to 15	May	Plant thickly and prune severely. Mice girdle in winter. Spring trimmings must be burned. Needs strict control.
Buckthorn (*Rhamus cathartica*).—The best strong hedge, as dense and tight as honey locust but not so high. Thorny. Never ragged. Moderate grower.	6 to 10		Spray with kerosene emulsion for hop louse. Old hedges that are out of condition are easily recovered by cutting back.
Trifoliate Orange (*Citrus trifoliatus*).—Best medium height hedge for the South where it is evergreen. Deciduous in the North. Foliage yellow in fall.			Not reliably hardy north of Philadelphia. White flowers followed by small yellow fruits make it ornamental also.
Tamarix (*Tamarix Gallica*).—Unexcelled for saline and alkaline soils, growing on the salt water's edge where nothing else will.	5 to 10		Flowers feathery pink on old wood; on new wood in var. *Narbonnensis*. Foliage small.
Japanese Briar (*Rosa rugosa*).—The only rose suitable for a hedge. White, pink and red flowers.	5 to 8	All Summer	Suited for boundary or screen.

BEST LAWN GRASSES FOR ALL PURPOSES

Common and Botanical Name	Region of Use	Lbs. per bushel cleaned seed	Sow per acre bushels alone	Conditions and Uses
Rhode Island Bent (*Agrostis canina*).	On sandy seasides.	15	3	For close, fine turf. Color very green.
Creeping Bent (*Agrostis alba*, var. *stolonifera*).	Low lying inland and dry valleys of the East.	15	3	Rapid growing, forms a strong turf, that is improved by heavy rolling or tramping.
Red Top, Fancy Red Top (*Agrostis alba*, var. *vulgaris*).	From Tennessee north.	14 35	4 5-6	Stands hot weather and hard usage. Fills in well with blue grass.
Beach (*Ammophila arenaria A. arundinacea*).	On railway cuttings and embankments on the sea coast.	15	3½	Dry, loose soils. Holds drifting sands and banks.
Biennial Sweet Vernal (*Anthoxanthum odoratum*).	Useful only to lend fragrance to the lawn when cut.	Used only in mixture two pounds to the acre.		Starts early in spring, and makes new root-leaves all the year after cutting.
Bermuda (*Capriola Dactylon*).	Is killed by frost; valueless north of Virginia. A weed in blue grass lawns where it dies early.	15	½	Can be used for binding banks. The best lawn grass for the South from Virginia to Florida Withstands heat and drought. Thrives on poorest soils.
Crested Dog's Tail (*Cynosurus cristatus*).	Valuable for shady places and under trees. Also for terraces on deep soil.	30	1	Same color as Kentucky blue and so mixes well with that. A good bottom grass. Not recommended alone. Prefers rich, moist soil.
Various Leaved Fescue (*Festuca heterophylla*).	Northern States and on cold, wet soils.	15	1½	Does best in cold, moist soils, rich in humus and potash.
Sheep's Fescue (*Festuca ovina*).	Useful in mixtures for the Northwest and for lands on poorest sands.	16	2	This is a "bunch" or "stool" grass with very fine foliage and dense dwarf growth for any uplands.
Slender Fescue (*Festuca ovina* var. *tenuifolia*).	Dry slopes on lawns or on dry, high situations.	22	1½	Finer leaf than sheep's fescue and stools like that. Recommended only in special situations.
Italian Rye (*Lolium Italicum*).	Very thickly or in mixture as far south as Jacksonville, Fla.	22	2½	Very rapid growing and valuable for short, quick effects. Is practically an annual.

BEST LAWN GRASSES FOR ALL PURPOSES—Continued

Common and Botanical Name	Region of Use	Lbs. per bushel cleaned seed	Sow per acre bushels alone	Conditions and Uses
Pacey's or English Rye (*Lolium perenne* var. *tenue*).	For quick effects in the Middle and Eastern States.	28	2	Makes good verdure in four weeks. Dies out in two or three years.
Canada Blue (*Poa compressa*).	Throughout the East and North including Canada on dry sand or clay.	14	3	Flatter, more wiry stem than the Kentucky grass, also bluer color. Used in the very cheap mixtures as a substitute.
Wood Meadow (*Poa memoralis*).	Best grass for very shady places in woodland parks.	19	1½	Very hardy and early, resisting heat, too.
Kentucky Blue (*Poa pratensis*).	Best lawn grass north of Washington and west to the Allegheny range.	14	3	Starts early, lasts till frost, fine texture, rich green color, smooth, even growth. Three years to establish. Dislikes some soils.
Rough Stalked Meadow (*Poa trivialis*).	More shaded portions of lawns or north side of buildings.	26	4-5	Does not do well on dry land. Forms a fine turf and dense mat.
St. Augustine (*Stenotaphrum secundatum S. Americanum*).	Florida and the West Indian Islands.			Coarse and upright leaf, but keeps green when even Bermuda grass burns out.

VI. WILD FLOWERS AND FLOWERLESS PLANTS

The beauty and inspiration of wild flowers, which lovers of Nature constantly bring to out attention, should by no means, be passed by. There are few, indeed, whose joy in living is not more than a little deepened by contact with the woods and meadows, perfumed with the scent of wild-growing flowers and blossoms, and made beautiful to the eye by a riot of colors both soothing and delightful. They are to be found under forest trees, in bushes and hedges, amidst grasses in meadows, on highways and declivities, and on rubbish heaps and in water; they crowd together, as though unwilling to be hidden from view.

Among the leading representatives of these plants, grouped according to the localities in which they are found, are sure to be the following.

FLOWERS THAT GROW IN THE WOODS

A prime favorite among the flowers of spring is the TRAILING ARBUTUS (*Epigaea repens*), a tailing plant of the Heath family, with branches six to fifteen feet long and evergreen leaves, called Mayflower in New England and Ground Laurel in the Southern States. It grows in sandy or rocky soils, especially in the shade of evergreen trees, from Canada to Texas. It is prized for its early blooming, and delicate flowers, now gathered in considerable quantities for city flower markets. In the early spring also the LUNGWORT (*Pulmonaria officinalis*) delights us with its violet and blue flowers; as does also the LIVERWORT (*Hepatica triloba*), the three-lobed leaves of which live through the winter. That familiar little favorite, the sweet-scented LILY OF THE VALLEY (*Convallaria majalis*), raises its tender string of blooms surrounded by two large leaves in May. This is followed by the sweet-scented WOODRUFF (*Asperula odorata*). In some districts the fresh leaves of the woodruff are used for making May wine; when dried they emit an agreeable scent, and are therefore frequently laid in wardrobes. Its leaves are stellate, and its small blossoms are arranged in umbels. It grows from nine to twelve inches high. Other plants found in the woods are the FORGET-ME-NOT (*Myosotis silvatica*), and the CENTAURY (*Erythræa Centaurium*). The rose-red blossoms of the latter are arranged in clusters, and its leaves have medicinal properties. Late in the year towards autumn the common LING or heather (*Calluna vulgaris*) opens its red blooms. The leaves are small, and arranged in four rows along the stem. The young heather contains a rich honey, and is consequently much sought after by all kinds of insects.

WILD FLOWERS AMONG THE HEDGES AND BUSHES

In March and April, in concealed spots, the sweet-scented VIOLET blows (*Viola odorata*), filling the air with its sweet fragrance every morning. The ANEMONE (*Anemone nemerosa*) raises its white flower, tinged with red, from the midst of three large green leaves. The WOOD-SORREL (*Oxalis acetosella*), sends out from its root graceful trifoliate leaves and white blooms traversed by violet veins. In the hedges and bushes, also, we meet with the ARUM (*Arum maculatum*), the common wake-robin or lords and ladies. On closely observing this plant, we shall find rather deep in the earth a tuberous root as large as a walnut, from which spring three or four long-stalked, bright leaves. Between the leaves a smooth stem arises six to nine inches high, which bears at its upper end the blossoms, surrounded by a greenish sheath. The arum has acrid properties, but its corm yields Portland sago or arrowroot. In the vicinity of this plant we also find the VALERIAN (*Valeriana officinalis*), the root of which possesses healing properties. It contains an oil, which is used as a remedy for cramp.

THE FLOWERS OF THE OPEN MEADOWS

The uniform green which covers the meadows all the year round is agreeably relieved by a large

number of plants with colored flowers. Here blooms the sky-blue GENTIAN (*Gentiana verna*), which delights both the eye and the heart. There the beautiful blue bells of the CAMPANULA (*Campanula Rapunculus*) raise their heads, together with the violet flowers of the SCABIOUS (*Scabiosa pratensis*), and the numerous bloom-whorls of the meadow SAGE (*Salvia pratensis*). Between these can be seen the red and white heads of the meadow and white CLOVER (*Trifolia pratensis* and *T. repens*); and from a distance we can recognize the small DAISY (*Bellis perennis*), the similar but larger Dog Daisy (*Chrysanthemum leucanthemum*), the yellow MEADOW SWEET (*Tragopogon pratensis*), and the DANDELION (*Taraxacum officinale*). In these the fructification is carried out by insects; but, as the single flowers are so small that they would be overlooked by the insects, Nature has arranged many of them in the form of a small chalice or cup, which can be seen from afar, especially in those cases where the radiating petals are different in color from the sepals, like those in the dog daisies. Many meadow plants grow with their stalks and blooms high over their neighbors, as though they were the lords of the meadows.

In these the flowers are very small; but as they are united in large numbers in flat umbals, they show up well. On the dry ridges blooms the PLANTAIN (*Plantago*), which has good healing properties; and the wild THYME (*Thymus Serpyllum*), a graceful plant, which is sometimes made into tea, and is frequently placed in children's baths. The shape of its blooms shows it to be a member of the family of the labiate flowers, to which belongs also the meadow sage.

FLOWERS OF THE WOODED PASTURES

Another large natural family of plants, the milkworts, have a pretty representative in the meadows in the CUCKOO-FLOWER (*Cardamine pratensis*). Its leaves are pennate, and the lilac-colored flowers contain four large and two short stamens; the fruit is a pod. Upon woody pastures we also often find the ORCHIS (*Orchis Morio*). From the two oval tubers a stem arises enclosed in sheath-like leaves. At the top of the stem are the curiously formed flowers, which are fructified by insects in a very peculiar and striking manner. The somewhat unattractive SOUR-SORREL (*Rumex Acetosa*), Fig. 13, is well known, and its soft stem and juicy leaves are sometimes eaten by children. The leaves are arrow-shaped; the small flowers are reddish in color.

WILD FLOWERS ON HIGHWAYS AND WASTE LAND

Here we meet, besides old acquaintances from the meadows, the GROUNDSEL (*Senecio vulgaris*) and the CHICKWEED (*Stellaria media*), both valued as birds' food, and common everywhere; the SHEPARD'S POUCH (*Capsella Bursa pastoris*), easily recognized by its almost three-cornered little pods, and blooming, like the groundsel, nearly all the year round; the white, spotted, and purple BLIND-NETTLES (*Lamium album, L. maculatum,* and *L. purpureum*), and the ORIGANUM (*Origanum vulgare*), are labiate flowers, which are diligently visited by insects for their honey. Here, too, are the bristly, blue-flowered ADDER-WORT (*Echium vulgare*); the round-leaved MALLOW (*Malva rotundifolia*); the BURDOCK (*Lappa major*), the blossoms of which cling to the clothes so readily; the common NETTLES (*Urtica*); and the TANSY.

FLOWERS IN CULTIVATED FIELDS

Several plants grow amid the corn which are really ornamental with their bright flowers. A very pretty example is the larkspur (*Delphinium Consolida*), a small graceful little plant, with numerous blue spur-like flowers. Near the latter we also find the blue CORNFLOWER (*Centaurea Cyanus*), which is so frequently plucked by children and woven into wreaths.

The CAMOMILE (*Matricaria Chamomilla*), is recognized by its strong odor. It has a small chalice with white petals, and is an important medicinal plant. The CORN-COCKLE (*Agrostemma Githago*) and the red POPPY (*Papaver Rhœas*) are also seen; and at the time when the wind sweeps over the field of stubble the latter is adorned with the wild PANSY (*Viola tricolor*), the leaves and flowers of which have healing properties, and are collected for medicinal uses.

THE GREAT GROUPS OF CRYPTOGAMS OR FLOWERLESS PLANTS

The Cryptogams are plants without true, or without visible flowers; to these belong the shave grasses, the ferns, the mosses, the algæ, the lichens, and the fungi.

The HORSE-TAIL (*Equisetum arvense*), frequently grows in damp, sandy fields. The spring stem of the plant is simple and reddish in color, and bears fruit called spores in an unright ear.

The WALL RUE (*Asplenium Ruta muraria*), belongs to the family of ferns. It grows everywhere on walls, and has a short root, three-cornered leaves, and along both sides of the middle ribs of the leaves the fruit lies in rows.

The COMMON FERN (*Polypodium vulgare*), grows on walls and rocks. It has a creeping stem, and beautiful serrated leaves, bearing on their underside the somewhat large fruit glands which contain the spores. Other familiar ferns are the WORM FERN (*Aspidium Filix mas*), and the EAGLE FERN (*Pteris Aquilina*), from three to five feet high.

The COMMON HAIR MOSS (*Polytrichum commune*), grows in all the woods and in wet fields. The stem is upright; the small leaves are pointed and serrated at their edges. The spores develop in a quadrangular sheath, which is surrounded by a cell. The mosses play an important part in the economy of Nature; they retain in the woods a quantity of the water which falls as rain, and thus preserve the lands from being flooded, store up moisture for the plants, and also influence the climatic conditions of a country. The so-called PEAT-MOSS (*Sphagnum*) enters largely into the composition of peat.

The REINDEER MOSS (*Cladonia rangifernia*), is a much-branched little plant of a greyish color. The small fruit corpuscles are at the ends of the branches. The reindeer moss is common in the pine woods of northern Europe.

The TOAD'S-STOOL (*Agricus muscarius*), grows in the woods in autumn. The blood-red cap has numerous white excrescences on its surface. It is very poisonous and ill-smelling, and has a bitter taste. It is often used as a poison for flies, but is also dangerous to men and animals.

The MUSHROOM (*Agricus campestris*), is common from May to October in fields, gardens, and meadows. It has lately also been cultivated in cellars and greenhouses. It is a favorite article of food, and one of the most useful of the edible fungi.

CAMPHOR TREE *(Cinnamomum camphora)*, one of the most beautiful of all trees, grows in China and Japan, more especially in the island of Formosa. It has also been planted in Ceylon and Florida. The wood of the tree is valued by the cabinet maker, but its chief value is in the solid, essential oil, called *gum camphor*, extracted from it by a process of distillation. When pure, camphor is a white, soft semi-transparent body, with a peculiarly strong aromatic odor, and a bitter, burning taste. It is used extensively in making celluloid and smokeless powder, in medicine and as a protection against insects. Nine-tenths of the world's supply of raw material is exported from Formosa. Its production is a monopoly of the Japanese government.

VII. TREES OF THE FOREST

THE forest trees are divided into two groups: Trees Bearing Foliage, and Trees with Aciculous Leaves. The former lose their leaves in autumn; the stiff linear leaves of the latter, on the contrary, live throughout the winter, with the exception of those of the larch tree.

Alder (*Alnus*), trees native to the North Temperate and Arctic zones and to the Andes into Chili. The Black Alder grows near the brooks. The male blossoms stand in long, cylindrical catkins; the female blossoms in small, roundish catkins. The fruit is found in small, cones. The alder tree blossoms in April and May. It may reach seventy feet in height and nine in girth, but seldom exceeds forty in height. The bark of the shoots is used in tanning and dyeing leather red, brown, yellow, or, with copperas, black. The wood is durable under water, and is said by Virgil to have been the first wood used by man for boats. It was used for piles at Ravenna and for the Rialto at Venice, and is still so employed in Holland. Its chief use is for gunpowder-charcoal. For this purpose shoots five or six years old, or about four inches across, are employed.

Ash (*Fraxinus*), a valuable timber-tree belonging to the olive tribe. It has smooth, olive-grey bark, black buds, opposite pinnate leaves of from seven to fifteen leaflets, flowers without calyx or corolla, and an oblong-winged fruit. Its wood is more flexible than that of any other European tree, and is used for walking-sticks, spade-handles, the spokes and felloes of wheels, etc. There are about twelve species native to North America. The best known are: COMMON ASH, a large tree one hundred to one hundred and fifty feet high, growing wild in southern Europe and northern Asia. WHITE ASH, a large tree forty-five to ninety feet high; Nova Scotia to Florida, westward to Minnesota and Texas. GREEN ASH, forty to fifty feet high, Vermont to Florida, intermittently to Utah and Arizona. RED ASH, a small tree, rarely more than forty feet high, growing in moist soil from New Brunswick to South Dakota, Florida, Alabama and Missouri. BLUE ASH, fifty to seventy-five feet high, Ontario, Minnesota, and Michigan to Alabama, west to Iowa and Arkansas. BLACK or HOOP ASH, a large tree, seventy to eighty feet high, Newfoundland to Manitoba, south to Virginia and Arkansas.

Aspen or Trembling Poplar (*Populus tremula*), has a greenish-grey bark. Its leaves have long stalks, and tremble at the slightest current of air. The AMERICAN ASPEN called QUAKING ASPEN or QUAKING ASP, is one of the most widely distributed trees of North America, growing from Alaska and Newfoundland to lower California. A slender tree with light green bark, maximum height 100 feet. Wood soft, light, and largely used for manufacture of wood pulp. The EUROPEAN ASPEN is a quick growing tree, fifty to eighty feet high. The wood is soft and porous, and is used in turnery and in interior finish for houses.

Beech (*Fagus*), a genus containing about sixteen species. The trees have smooth, silver-grey trunks, egg-shaped leaves like leather, and blossoms at the base of the leaves. The beechnuts are three-cornered; they grow in couples in a wooden capsule. The beech trees attain a height of from sixty to ninety feet, and blossom in April and May. The AMERICAN BEECH is the only North American species. It is a beautiful tree seventy to eighty and sometimes one hundred feet high, and is one of the most widely distributed trees of eastern North America. The wood is tough, close grained, and is largely used in the manufacture of tool handles, chairs and for fuel. The COMMON BEECH, forming pure forests in many parts of Europe, is a large tree one hundred to one hundred and twenty feet high. The wood is dark colored, solid, and very durable under water and is much used in cabinet making, for weirs, and for fuel. The bark is sometimes used in tanning. The nuts are used for the manufacture of beech oil.

Birch (*Betula*), is known by all on account of its chalk-white bark, and its fine, pendent leaves. The male and female blossoms of this tree also grow separate on the same plant. Its seeds are small and plumed, whereby they are particularly adapted for being sown by the aid of the wind. There are about thirteen species in North America. COMMON BIRCH, abounding in northern Europe, is a beautiful tree sixty to seventy feet high. The bark is used in medicine and dyeing, and it yields the birch tar employed in the preparation of Russia leather. RED or RIVER BIRCH grows in the United States from Massachusetts to Iowa and Kansas, south to Florida and Texas. It is a slender tree, seventy to ninety feet high, which produces a hard, valuable timber. CHERRY BLACK or SWEET BIRCH is a large tree, sometimes eighty feet high. Wood fine grained and valuable for making furniture. The bark yields an oil identical with the oil of wintergreen. It grows from Newfoundland to western Ontario, Florida, and Tennessee. YELLOW BIRCH, a large tree, maximum height one hundred feet, is used in shipbuilding. It grows from Newfoundland to Manitoba, south to Carolina and Tennessee. PAPER or CANOE BIRCH, a large tree, maximum height eighty feet, is of a beautiful white color, and the bark is capable of division into thin sheets, used for making canoes, baskets, and ornaments. Found in Newfoundland to Alaska, northern Pennsylvania, Michigan, and Washington.

Buttonwood. See Plane Tree.

Cedar (*Cedrus*), the popular name of a variety of trees, mostly agreeing in having a reddish-brown aromatic wood. The coniferous genus includes only four forms, all native to the Old World, the most noted of which are the Cedars of Lebanon, frequently mentioned in the Bible. It has its needle-like leaves fascicled, like the larches; but unlike those trees, evergreen, so that they remain on the tree for several years after the dwarf-shoot has elongated. Its cones are erect, with broad, thin-edged scales which ultimately fall away from the axis, as in the firs. The WHITE CEDAR of the United States is more nearly a cypress, and the so-called RED CEDAR is a juniper. The wood of the latter is used in making lead-pencils. The species native to the West Indies, yields the wood known as Honduras, Jamaica, or Barbadoes cedar, used for cigar boxes.

Chestnut (*Castanea vulgaris*), is a fine tree that may reach a large size, and has deeply furrowed bark and large, glossy, serrate but simple leaves in tufts, which turn yellow in autumn. Its flowers are in long pendulous catkins. The dark brown nuts are surmounted by the remains of the perianth, being "inferior" fruits. In a wild state two or three kernels or seeds, separated by a membrane, are contained in each nut; but the Lyons' marron, the most valued cultivated race, contains only one. The tree is native from Portugal to the Caspian and in Algeria, and is represented by allied forms in Japan and temperate North America, flourishing in the Alps and Pyrenees at 2,500 to 2,800 feet above sea-level. Its timber resembles oak, but is softer and more brittle.

THE OAK

Massive strength is the chief characteristic of the oak, and it was the broad-based trunk of an oak that suggested the design for the first great lighthouse. The branches twist about in zig-zag fashion, and the thick bark is deeply furrowed.

THE BIRCH

We have only to glance at the birch to realize that its name "the lady of the woods" is well deserved. Its chief characteristic is slender gracefulness, and we cannot mistake the silvery white bark, quite unlike any other tree.

Cork Oak or Cork Tree (*Quercus suber*), is a species of oak, native of southern Europe and northern Africa, the spongy bark of which is the common cork of commerce. It ranges from twenty to forty feet in height, attains a diameter of five feet, and sometimes lives three hundred to five hundred years, producing crops of bark for one hundred and fifty years.

Cypress (*Cupressus*), is an evergreen tree of the pine family, with small, imbricated leaves and globular cones, comprising about twelve species, in northern regions of the world. The COMMON CYPRESS of Europe is famous for its durable wood and is believed to be the cedar or gopher wood of the Bible. The MONTEREY CYPRESS, a beautiful tree sometimes one hundred and fifty feet high and eight or ten feet in diameter, grows near the sea in California and three others occur on the Pacific Coast. The so-called CYPRESS or WHITE CEDAR of the Eastern States, and the BALD CYPRESS of southern swamps, valued for timber, are distant varieties of cypress.

Dogwood (*Cornus*), is a shrub or small tree, the wood of which is exceedingly hard and is used for many purposes. The astringent bark and sometimes the leaves are used in medicine. There are about eighteen species in the United States. The FLOWERING DOGWOOD is a small tree, native of the Eastern States. It has showy white petal-like bracts surrounding its clusters of small flowers.

Ebony (*Efenaceæ*), is chiefly a species of tropical trees. The hard, dark colored heartwood of these is the source of most of the ebony of commerce. Those of India, Ceylon, and other tropical countries, furnish the best quality.

Elm (*Ulmus*). There are about six species which are native to the United States. They attain a height of forty-five to ninety feet, and blossom before their leaves appear, in March and April. The AMERICAN WHITE ELM is a large tree ninety to one hundred feet high, growing from Newfoundland to Florida and Texas. The wood is tough, strong, and largely used for wheel hubs, in cooperage, and for shipbuilding. It is a fine street and park tree. The CORK ELM is a tree seventy to ninety feet high, growing from Quebec and Vermont westward to Nebraska and Tennessee. The wood is considered the best of American elms, and is much used for agricultural implements and bridge timbers. The SLIPPERY, or RED ELM is a tree sixty to seventy feet high, growing from Ontario to Florida, westward to Nebraska and Texas. The wood is durable in contact with the soil and is much used for fence posts and railway ties. The mucilaginous inner bark is used in medicine.

Eucalyptus, a genus of *Myrtaceæ*, contains about two hundred lofty trees occurring chiefly in Australia and the Malayan Archipelago. Many reach a height of one hundred and fifty feet and a girth of twenty-five feet, and they frequently become hollow. The species are of great economic value, yielding oils, kinos, and useful timber, while the well-known oil of eucalyptus is obtained from the blue-gum tree.

Fir (*Abies*), a genus of the Pine family containing about twenty-five species, natives of the cooler portions of the north temperate zone. The SILVER FIR, a common tree in central Europe, and is common to the mountainous forests of Germany. It reaches ninety to one hundred and thirty feet in height, and has a smooth, light silver-grey bark, and needle-shaped leaves, which, although they stand singly and in a spiral form round the branches, are yet distinctly turned towards two sides, and are serrated at their points. The large, conical fruits stand like tapers upright on the branches, and decay upon the tree; whilst their spindles remain standing. The wood of the white fir tree is much valued. It is used as timber, and in particular for making masts; it is also useful for making all kinds of carved work, and for the manufacture of musical instruments. It is also the source of the Strassburg turpentine. The BALSAM FIR is a tree fifty to eighty feet high, growing from Virginia northward. Canada balsam is made from the sap. The WHITE FIR or GREAT SILVER FIR is a large tree, often three hundred feet high and ten feet in diameter, growing from British Columbia to lower California. The wood is soft and extensively used for cooperage and boxes. The RED FIR is a large tree one hundred and fifty to two hundred feet high, found in the same regions as the white fir. It is often planted in Europe as an ornamental tree. The MEXICAN FIR is a magnificent silver-leaved tree one hundred and fifty feet high.

Gum. The name given to several trees in America and Australia: (a) The BLACK-GUM, one of the largest trees of the Southern States, bearing a small blue fruit, the favorite food of the opossum. Most of the large trees become hollow. (b) A tree of the genus *Eucalyptus*. See Eucalpytus. (3) The SWEET GUM tree of the United States, a large and beautiful tree with pointedly lobed leaves and woody, burlike fruit. It exudes an aromatic juice. The wood is now extensively used in cabinet work and interior finish.

Hemlock Tree (*Tsuga*), is a genus of the Pine family containing about four species which are native to North America. The COMMON HEMLOCK is a large tree sometimes attaining a height of one hundred and ten feet, and growing from Nova Scotia to Alabama and west to Wisconsin and Minnesota. The wood is light and soft and is extensively used in building. The bark is largely used in tanning and hemlock oil is distilled from the branches and leaves. There are many cultivated varieties which are very ornamental. The CAROLINA HEMLOCK is a tree attaining a maximum height of eighty feet, and growing in Virginia, North Carolina, and Georgia.

Hickory (*Carya*), is represented by ten species, exclusively of North America. Their timber is very heavy, strong, and tough, and is much used in the manufacture of agricultural implements, carriages, and hoops for casks. The fruit is a hardshelled nut, which in some species has an excellent flavor. The SHAGBARK or SHELLBARK HICKORY is a large tree, sometimes one hundred and twenty feet high, growing in rich soils from Ontario and Minnesota south to Florida, Kansas and Texas. The nuts form an important article of commerce, though less used that the pecan. The WHITEHEART HICKORY or MOCKERNUT is a large tree seventy-five to one hundred feet high, growing from Ontario to Florida, occasionally to Missouri and Texas. It has a thick-shelled, edible nut. The PIGNUT HICKORY, a tree seventy-five to one hundred and sometimes one hundred and twenty feet high, ranges from Ontario to Florida, westward to Nebraska and Texas. See also PECAN.

Horse-Chestnut (*Aesculus*), is rarely found in forests, but frequently in pleasure-gardens. This beautiful tree, of sixty feet and over, has large leaves, and splendid yellow-and-red colored blossoms forming large pods. The brown chestnuts are enveloped by a prickly cover, which bursts open in the autumn. The OHIO or FETID BUCKEYE, reaching a height of about fifty feet, grows from Pennsylvania to Alabama, west to Michigan and Oklahoma. The wood is used for making artificial limbs and wooden ware. The SWEET or BIG BUCKEYE is a large tree eighty to ninety feet high, growing from Pennsylvania to Georgia, west to Iowa and Texas, and often planted as an ornamental tree. The CALIFORNIA BUCKEYE is a small tree thirty to forty feet high, native of California, and sparingly planted for ornament.

Judas Tree (*Cercis siliquastrum*), is a beautiful leguminous tree, growing wild from Japan to the

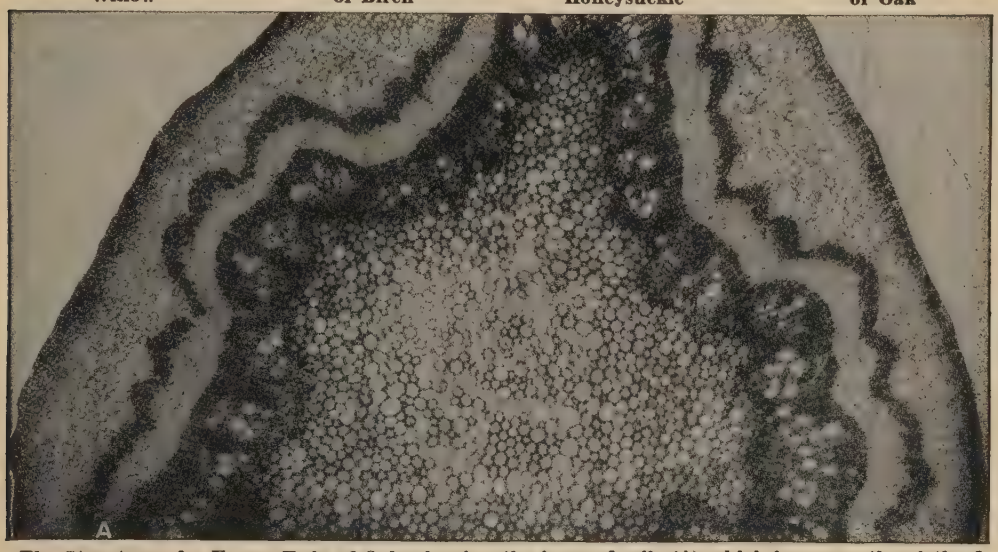
BARK, CELLS, HEART AND RINGS OF THE TREE

Scaly Bark of Willow

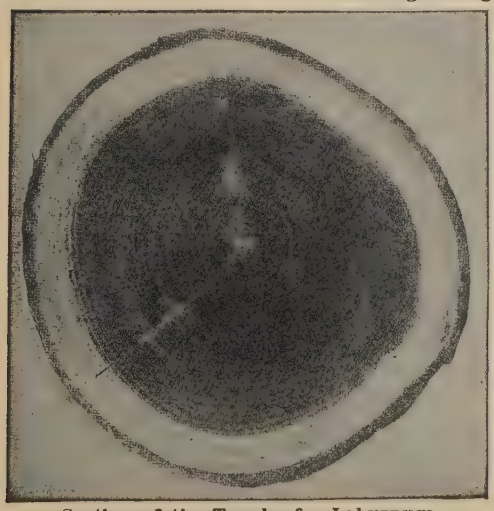
Membranous Bark of Birch

Fibrous Bark of Honeysuckle

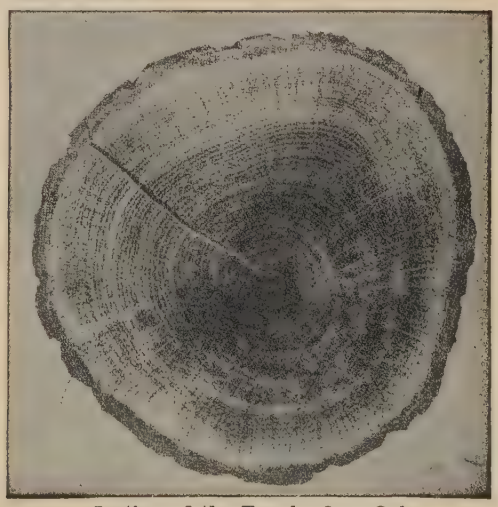
Fissured Bark of Oak



The Structure of a Young Twig of Oak, showing the layer of cells (A) which increases the girth of the twig as it grows into a branch



Section of the Trunk of a Laburnum, showing Heart and Sap-wood



Section of the Trunk of an Oak, showing the Annual Rings

shores of the Mediterranean, with smooth kidney-shaped leaves, glaucous above, and pink or red flowers, which spring from both old and young wood before the appearance of the leaves. From its appearance at this season the tree shares with the elder the sinister reputation of having formed the gallows of Judas Iscariot.

Juniper Tree (*Juniperus communis*), is rarely seen as a tree, but appears usually as a low shrub. Its awl-shaped, pointed leaves stand always by threes of the same height on the young shoots. The male blossom catkins are short-stalked, and stand singly in the axils of the bracts; the fruit is a black berry. These berries are employed for medicinal purposes. The so-called WHITE CEDAR of the Eastern States and the BERMUDA CEDAR, much prized for timber, are junipers.

Larch (*Larix Europæa*), has leaves which grow in clusters, and drop during the Autumn. Its bark is rough and cracked; its red-blossom catkins stand at the side of the yellow catkins. Its egg-shaped little cones have backward bent stalks. The larch tree attains a height of from forty-five to sixty feet, and is found in forests everywhere. The AMERICAN LARCH or TAMARACK is a slender tree fifty to sixty feet high, growing from Virginia to Hudson Bay. It is often planted as an ornamental tree and the wood is highly valued for shipbuilding and for telegraph poles.

Linden or Lime (*Tilia*), is the emblem of intense feeling. It has been from time immemorial the favorite of the Germans. Below the large linden trees the judicial proceedings, the fairs, and national games formerly took place in Germany, and to this day men and women like to sit under the village linden tree, and talk of the good old times. They do not blossom before June and July. The blossom is five-leaved, and contains many stamens and one pistil. The fruit is a little nut. The AMERICAN LINDEN or BASSWOOD is a large tree seventy to one hundred and twenty-five feet high, growing from New Brunswick to Georgia, west to Nebraska and Texas. The wood is extensively used for making cheap furniture and paper pulp. The SOUTHERN BASSWOOD or WHITEWOOD is a small tree forty to fifty feet high growing from Long Island to Florida, west to Texas. The WHITE BASSWOOD or BEE TREE is a forest tree forty-five to seventy feet high, Pennsylvania to Florida, west to Illinois and Tennessee.

Locust is a name applied to various trees of the Pea family. The AMERICAN LOCUST TREE or the FALSE ACACIA is seventy to eighty feet high, growing from Pennsylvania to Georgia. It is widely naturalized in most states east to the Rocky Mountains. The wood is compact and hard and is extensively used for shipbuilding and all purposes where great strength and toughness are required.

Mahogany (*Swietenia Mahagoni*), is a native of Mexico, Central America, and the West Indies, and yields one of the most generally used of cabinet woods. The leaves resemble those of the ash; the flowers are clustered and small, with their parts in whorls of five, and ten united stamens; and the fruit is a pear-shaped, woody capsule with winged seeds. The wood is a rich reddish-brown, often richly mottled, uniform in grain, susceptible of the highest polish, and very durable. In Mexico the timber is sometimes in thirty-foot lengths and forty-eight inches square. Mahogany is commonly divided into SPANISH, the darker, heavier and more figured, from San Domingo and Cuba, and HONDURAS, lighter, softer, and plainer, from the mainland. It is employed in carving, turning, veneering and cabinet-making, and for solid furniture, easily holding first rank among cabinet woods.

Maple (*Acer*). This genus of trees contains nearly one hundred species, natives of north temperate regions, especially North America and eastern Asia. The SUGAR MAPLE is ninety to one hundred and twenty feet high, and grows from Newfoundland to Georgia, west to eastern Nebraska and Kansas. The wood is extensively used in cabinet work and interior finish. Large quantities of sugar and syrup are made from the sap. The SILVER or SOFT MAPLE is found from New Brunswick to Florida, west to Ontario, Nebraska and Oklahoma. It is often planted as a shade tree. The SCARLET or RED MAPLE grows in swamps and low ground from New Brunswick to Manitoba, south to Florida and Texas. The close-grained wood is largely used for furniture, and in turnery. The OREGON MAPLE grows from Alaska to California. It is often planted as an ornamental tree.

Mesquite (*Prosopis*), is a genus of trees containing about sixteen species, natives of America, Asia, and Africa, three of which grow in the United States. It varies from a straggling shrub to a widely-branched tree fifty feet high and occurs from central Texas to eastern California, and southward to Chile and Argentina. The very heavy wood is used for fuel and fence posts, while the pods and leaves are much eaten by stock. The SCREWPOD MESQUITE is twenty-five to thirty feet high and valuable in arid regions.

Oak (*Quercus*), is most numerous in temperate climates, though some are tropical; fully fifty species occur in the United States, with many intermediate forms or hydrids. The Oak is a true giant among forest trees. Its trunk often attains a circumference of thirty feet. Its bark is smooth in the young trees and rough in the old oakes. The strong, widely extended boughs are pronged and knotty; the crown is large, with a sinuate outline. The blossoms are within long pendent catkins and appear in the month of May. The bark and the acorns, which are contained in pretty little cups, are medicinal. Along the stems and the boughs mosses and lichens grow exuberantly. In the galls of the leaves and branches different gall insects live. The horn beetles suck the sap of the oaks, and the acorns form the food of squirrels and other rodents. The EUROPEAN OAK, the most important Old World timber oak, is sparingly planted in the United States. The WHITE OAK, the most valuable American timber oak, occurs from Texas to Minnesota and eastward. With similar range, but less valuable for timber, are BUR OAK or MOSSY CUP OAK, the SCARLET OAK and the RED OAK. The COW OAK or BASKET OAK and the YELLOW or CHESTNUT OAK produce edible acorns. The bark of the QUERCITRON is used in tanning, as a yellow dye, and in medicine. The LIVE OAK, once famous for ship-building, is a sturdy species with entire evergreen leaves occurring in the Southern States, Cuba and the Pacific States.

Osage Orange or Bow Wood (*Maclura pomifera*), is a native of the southwestern United States. It attains a height of twenty to sixty feet, and is extensively planted for hedges, while the wood, of orange color and of great hardness, is valuable for fence posts, mallet heads, and to some extent in cabinet work.

Pine (*Pinus*), comprises a genus of about eighty species, nearly two-thirds of which occur in the northern part of the western hemisphere. The WHITE PINE, a tree seventy-five to one hundred feet high, is one of the most important timber trees of North America. Its range is from Newfoundland to Minnesota, south to Georgia. The wood is soft, straight grained, and is much used for building and cabinet work. The YELLOW PINE or LONG-LEAVED PINE sometimes attains a height of one hundred feet, and grows in sandy soil from Virginia to Florida and Texas. The wood is heavier and stronger than that of any other pine, and is used in all kinds of building. The tree is the chief source of turpentine, tar,

resin, etc. The WESTERN YELLOW PINE or BULL PINE is sometimes one hundred and fifty to two hundred and fifty feet high and five to eight feet in diameter. It is found from the Rocky Mountains to the Pacific coast and is one of the most important lumber trees of the West. The SUGAR PINE of Oregon and California attains a height of one hundred and fifty to three hundred feet and a diameter of more than ten feet. The timber is strong, straight grained, and is much used for a finishing lumber and cabinet work.

Palm Family (*Palmaceae*), is a very distinct natural family of trees and shrubs, chiefly tropical and subtropical, embracing about one thousand species which are second in economic importance only to the cereal grasses. The Palm Trees have generally straight, scaly trunks without boughs, and many species attain a considerable height. Their large fan-shaped leaves grow near the top, and form a beautiful crown. The numerous blossoms stand in long panicles. The palm trees represent the only riches of many tribes of mankind in the tropics, providing them with food, drink, dress, and building materials for their dwellings. The most valued are the cocoanut, date and sago palm trees. The large nuts of the first named are the well-known cocoanuts.

Plane Tree (*Platanus*), a genus of six or seven species, is a native of the north temperate zone. The SYCAMORE, PLANE TREE, or BUTTONWOOD reaches a height of one hundred and thirty feet with a trunk diameter of fourteen feet. It is found from Quebec to Georgia, west to Manitoba and Kansas. The wood is a favorite material for tobacco boxes and butcher blocks and is largely used for furniture. Other species in the United States are the CALIFORNIA SYCAMORE and the ARIZONA SYCAMORE, both large trees.

Poplar (*Populus*), a hardy genus of about twenty trees, native to temperate and cold regions. Half of the species occur in the United States, all of soft wood and rapid growth. The COTTONWOOD, common along streams from the Rocky Mountains eastward, sometimes attaining one hundred and fifty feet in height and a diameter of seven feet, is much planted for ornament. The BALSAM POPLAR, sometimes one hundred feet high, occurs northward and in Siberia. The EUROPEAN WHITE POPLAR and BLACK POPLAR, much-planted ornamentals, have become naturalized in the Eastern States. The LOMBARDY POPLAR, with very upright boughs, frequently grows along the roadside in Asia, Europe and America.

Redwood. See Sequoia.

Sandalwood (*Santalum album*), is a small tree, native of India and the Indian Archipelago. It produces a compact, fine-grained wood which is used for making small ornamental articles and possesses a remarkable fragrance which persists long after it has become thoroughly seasoned.

Sassafras is a genus containing but two known species, one in North America and the other in China. The SASSAFRAS or AGUE TREE, is eighty to ninety feet high, is found from Canada to Florida, west to Kansas and Texas. Oil of sassafras, used for flavoring confectionery, is distilled from the roots, and the bark is frequently employed as a household medicine and beverage.

Sequoia, a genus of trees named after a remarkable Cherokee Indian (otherwise George Guess), who gave his tribe a written alphabet of eighty-six characters, and died in New Mexico in 1845. There are only two living species, both natives of Western North America, the Big or Mammoth Tree and the California Redwood. The Big Tree is a native of the Sierra Nevada, and reaches over one thousand years of age, four hundred and fifty feet in height, and one hundred and twelve feet in circumference. The Redwood has a wider range in latitude as a wild tree, and reaches three hundred feet in height. It has a shaggy, reddish bark and very dark foliage. Its wood is of good texture, but monotonous in grain. It is used in cabinet work and interiors.

Spruce (*Picea*), a genus of about eighteen species, native of the Northern Hemisphere. The WHITE SPRUCE is a slender tree fifty to one hundred and fifty feet high, found from New York to British Columbia, north to Newfoundland, Hudson Bay and Alaska. The wood is light and soft and is largely used for construction and for paper pulp. The BLACK SPRUCE is twenty to thirty and very rarely one hundred feet high; grows from Newfoundland and Hudson Bay and Alberta south to North Carolina, Michigan and Minnesota. It is largely used for wood pulp and paper. The RED SPRUCE, seventy to eighty feet high, grows from Nova Scotia to Virginia, and is largely manufactured into lumber. The TIDELAND or SITKA SPRUCE is a large tree usually one hundred feet, sometimes two hundred feet high, occurring abundantly from northern California to Alaska. Its valuable timber is used for all kinds of building purposes. The NORWAY SPRUCE is largely planted in the Eastern States as an ornamental tree.

Sycamore. Only certain trees of the genus *Ficus*, mostly natives of Asia and Africa, are properly called sycamores. The EGYPTIAN SYCAMORE supposed to be the sycamore of the Bible, is a large spreading tree often planted for shade in Egypt and western Asia. In northern Europe this name is also given to the species of maple, and in the United States to the AMERICAN PLANE TREE. See PLANE TREE.

Upas (*Antiaris toxicaria*). A tree found in the Philippine Islands and tropical Asia. The fiber of the bark is sometimes made into cloth and the juice of the roots is used by the Malays for poisoning their arrows. This tree figures in both religion and mythology.

Walnut (*Juglans*), a genus of about ten species, mostly natives of North America and Asia. The BLACK WALNUT is sometimes one hundred to one hundred and twenty-five feet high, growing from Ontario to Florida, west to Nebraska and Texas. The dark brown wood is largely used for cabinet making and gunstocks. The WHITE WALNUT or BUTTERNUT resembles the black walnut, but is seldom over one hundred feet high. The wood is used in the interior finish of houses and for furniture. The CALIFORNIA WALNUT, a tree sometimes sixty-five feet high, is often cultivated in California for shade and as a stock on which to graft the English Walnut. The ENGLISH WALNUT is sixty to ninety feet high, native of Persia, and has long been cultivated for its edible nuts.

Willow (*Salix*), a genus of over one hundred and fifty species, mostly of cool, northern regions, fully one-half occurring within the United States. The leaves are egg-shaped and wrinkled; the blossoms yellow and greenish. They possess great quantities of honey, and attract, therefore, all kinds of insects, especially bees. The WEEPING WILLOW is much planted for ornament. The EUROPEAN OSIER is cultivated for its twigs. Of the native species, the shrubby SHINING WILLOW, the BLACK WILLOW, is sometimes forty feet high, and the HEART-LEAVED WILLOW are among the best known.

Yew (*Taxus*), a genus of some six trees and shrubs, are widely distributed in the northern hemisphere, three species occurring in the United States. The AMERICAN YEW is a low, straggling shrub seldom over five feet high growing in woods from Newfoundland to Manitoba and south to Virginia and Iowa. The FLORIDA YEW is a bushy tree rarely twenty-five feet high. The CALIFORNIA YEW is a tree forty to fifty feet high occurring from British Columbia to California, sometimes cultivated in gardens in Europe. The hard wood is used for fence posts. The EUROPEAN YEW is a native of Europe and Siberia reaching a height of forty feet.

VIII. FIBER AND COMMERCIAL PLANTS

The cultivation of the fiber-yielding plants and the manufacture of their products into textiles, ropes, cordage, and matting are among the most important industries of the world, and afford employment directly and indirectly to many millions of people. The industries, moreover, are of great antiquity, for we have definite evidence from the Lake Dwellings of Switzerland that flax was cultivated and used as a textile during the Stone Age, and the occurrence of linen cloth in the tombs of Egypt and constant references to the same material in the earliest books of the Bible are well known to everyone. How and when mankind first became aware of the possibilities of vegetable fibers as materials for clothing it is not easy to say, but it is not improbable that he first employed the fibers to supply his need for string cordage, especially in his hunting expeditions, and that gradually the idea of weaving the strings to form a fabric occurred to him. The apparatus employed must have been of extreme simplicity and the finished product crude according to modern ideas; but that thousands of years ago textiles of superlative quality, rivaling anything that can be produced to-day, were manufactured by Eastern races is a matter of history and observation.

Annotto, Anatto or Arnotto. The red substance imported under this name consists of the aggregated seed pellicles of *Bixa Orellana*. The coloring matter is best extracted by alcohol, as it is not very soluble in water. It is the source of coloring for dairy products, being the standard butter and cheese color in the United States, England and Holland. Has also a limited use as a dye in calico printing. It was anciently used by natives of Brazil, Central America, and West Indies to stain their bodies red, and by Mexicans in painting. Cultivation prehistoric in tropical America. Now naturalized in India.

Bamboo (*Bambusa*) grows in the tropics of Asia, Africa and America. The plants are in reality merely gigantic grasses. The stems are hollow and contain only a light pith, but they are jointed and at the nodes strong partitions stretch across the inside. They grow in clumps, and may reach a height of one hundred and twenty feet and a thickness of ten inches. Some species flower only once, some every year, and others at longer intervals.

The Bamboo is noted for its great economic importance, and serves a variety of useful purposes. The young shoots of some species are cut when tender and eaten like asparagus; the seeds also are sometimes used as food, and for making beer; some species exude a saccharine juice at the nodes which is of domestic value.

The hard stems are converted into bows, arrows, quivers, lance-shafts, masts of vessels, bed-posts, walking-sticks, poles of palanquins, rustic bridges, bee-hives, water-pipes, gutters, furniture, ladders, domestic utensils and agricultural implements. Split up finely they afford a most durable material for weaving into mats, baskets, window-blinds, ropes and even sails of boats. Perhaps the greatest use to which they are put is in building, for in India, China, Japan, Assam, Malay, and other countries of the East, houses are frequently constructed solely of this material.

Betel-nut (*Areca Catechu*), a palm cultivated in tropical Asia. The seed or nut resembles a nutmeg in size and in color. Pieces of this nut are rolled up with a little lime in leaves of *Piper Betel*, the Betel-pepper, and chewed by the natives. The pellet is hot, acrid, aromatic and astringent, tinges the saliva red, and stains the teeth. Its charcoal is used as toothpowder.

Cultivated extensively in the East Indies, where the consumption of leaves by chewing with the areca nut is enormous. Narcotic stimulant.

Cinchona, a genus of evergreen trees, includes thirty-six species, about a dozen of which are utilized. They are natives of the Andes, growing mostly between five thousand and eight thousand feet above the sea-level. It is the source of quinine, the most important drug in tropical medicine, and widely used throughout the world. Its cultivation is becoming quite extensive.

The bark introduced into Europe in 1639 by the Countess of Cinchon, whence the name. Now extensively cultivated in India, Japan, Ceylon and Jamaica.

Cotton (*Gossypium herbaceum*) is one of the most important cultivated shrubs. It is an annual and grows from two to four feet in height, with stalks branching extensively. At the bottom of the stalk the limbs are longest, and at the top they are light and short.

The flowers are white, or pale yellow, or cream-colored the first day. They darken and redden on the second day, and fall to the ground on the third or fourth day, leaving a tiny boll developed in the calyx. This boll develops and enlarges until maturity, when it is somewhat like a hen's egg, both in size and shape. This boll is the house of the seed and lint—the products of commerce. In it are from three to five apartments or cells (often more than five in improved types), which hold the lint from its earliest formation until it is picked in the fall. The bolls of the cotton plant mature all the way from the last of August until frost attacks them. When matured, the fibrous wool, known as seed cotton, is gathered, ginned, and baled. When separated from the seed the lint becomes the cotton of commerce.

The chief commercial types of cotton are American upland, sea island, Egyptian, India, Brazilian and Peruvian. These differ in the length of the individual fibers (staple). The quality is indicated by the grading under such names as fine, good, good fair, fully fair, middling fair, good middling, middling, etc. Sea island cotton has the longest staple and is used for the finest qualities of yarn and fabrics. Egyptian cotton also has a long staple. Large amounts are imported into the United States.

Cotton is next to corn the most valuable farm crop of the United States. Nearly three-fourths of all the cotton produced annually in the world is grown in the south Atlantic and gulf states. The remainder comes mostly from India, Egypt, China, Brazil, and Asiatic Russia. A comparatively small percentage of the crop is sea island cotton from the coast of Georgia and from islands in the West Indies. The area of cotton production is spreading in the United States as well as in foreign countries.

Cotton fiber is spun into yarn and made into thread, muslin, calico and hundreds of other cotton or part cotton fabrics. Mercerized yarn is prepared by treatment with strong caustic alkali. Cotton linters are used in cheap yarns, cotton batting, mattresses, and the manufacture of celluloid and artificial silk.

Cotton seeds are subjected to heavy pressure in machines in order to extract the oil. The oil-cake is a valuable cattle food and the hull are used for fuel or for paper making.

Cottonseed oil is used for table purposes, for packing sardines, for cooking, making soap, candles, etc.

The greatest centers of cotton manufacture are in England, New England, the Carolinas and Georgia. Germany, Russia, India and Japan are among the important manufacturing nations.

Modern cotton mills are of immense size. The bales are opened, the cotton cleaned, carded, and twisted into slivers, rovings, and finally into yarn. Raw cotton, cotton yarn and cotton fabrics are all important in trade. About half the crop of the United States is exported in bales to be manufactured in the mills of other countries.

England has an enormous foreign trade in cotton fabrics. The United States exports chiefly unbleached muslin, more of which goes to China than to any other country.

It is certain that cotton was in use in India three thousand years ago, and in Egypt more than two thousand years ago. It was well known to the ancient civilizations of Mexico, Peru, Central America and the West Indies. When the European voyagers, Columbus, Pizarro, and Cortez, visited for the first time these ancient civilizations, the manufacture of cotton was in a flourishing condition, and the quality and beauty of the cotton goods of a high order.

Flax (*Linum usitatissimum*) has been cultivated for centuries. Along the upright stalk, of eighteen to twenty inches high, small narrow leaves grow; the blossoms appear in July and August, and are light blue.

Flax is grown for fiber in Russia, Belgium, Italy, France, Holland, Ireland and Egypt. Little flax fiber is produced in the United States. Plants for fiber production are straight stemmed, while the varieties grown for seed have many branches. Flax seeds are produced in Russia, India, Argentina and the United States. Plants harvested for fiber are pulled up by the root in order to obtain the greatest possible length. The fiber is separated from the stalk of the plant by retting, a process of partial decay, breaking and scutching to remove the woody parts and hackling or combing. In the best grades of flax most of this work is done by hand.

Flax or linen fiber and linseed oil are the chief products of the plant. Tow is a by-product in making linen and flax yarns and fabrics.

Linseed oil is used in paints, varnishes, printer's ink, oilcloth and linoleum. Linseed oil-cake is a valuable cattle food. Flax seeds find limited use in medicine.

Flax yarns are used in making rope, twine, bagging and coarse, unbleached fabrics. Linen yarns are made into products of the better grade, including fine linens, cambrics, laces, etc.

Linen is bleached by exposure to the sun and by treatment with a dilute solution of chloride of lime. Linen rags are the stock for the best qualities of paper.

The United States imports flax fiber mainly from Europe, as well as large quantities of linens, laces, etc. Some flax seeds are imported and large amounts of linseed oil-cake are sent to Europe.

Guava (*Psidium Guayava*), small trees of tropical America belonging to the Myrtle family. The fruits vary very much in size, shape and color, the most valued being the *white guava,* with pear-shaped, yellow or whitish fruits the size of a hen's egg. The inferior *red guava* which is more apple-shaped, is also used in preparing guava-jelly and guava-cheese, which preserves, owing to the perishable character of the fruit, are the only forms in which the fruit is imported. The tree has been naturalized in the East, and is commonly grown from Mexico to Peru at date of Spanish discovery. Since widely diffused in East and West India Islands, India, and China. Recently established in Florida and California.

Hemp (*Cannabis sativa*) is cultivated in many countries. It is about three feet in height, has finger-like leaves and the fruit has the form of a little nut. The home of the hemp is the East Indies. The stalks are dried in the sun, then steeped in water or upon wet (moist) meadows, and again exposed to the sun, when the woody parts are stripped off. The remaining fibers are manufactured into cables, ropes, sail-cloth, linen and paper.

Other hemps of different botanical origin and having quite different qualities are called by such names as manila hemp, sisal hemp, tampico hemp, Mauritius hemp, sunn hemp, bowstring hemp, etc. Strictly speaking, none of these is true hemp.

It is cultivated in Russia, the warm countries of Asia, the shores of the Mediterranean, Kentucky, Missouri, Illinois and California. Russia produces more hemp fiber than all the rest of the world. Russia and Italy are the largest exporters.

As with other cordage fibers of this character, the long, combed fibers are called line and the short strands, tow. The commercial fiber is longer, coarser and less strong than flax. It can not be bleached perfectly white, although used in so-called coarse linens. Russian, Italian and Kentucky, as applied to hemp, denote the country of origin. Italian hemp is the finest, Kentucky the strongest.

Hemp oil is pressed from the seeds. It is used in paints, varnishes and soap. The oil-cake is a cattle food.

Hop (*Humulus lupulus*), sometimes grows wild in hedges and bushes, and is also frequently cultivated. Its stalk, which leans to the right, is eighteen to twenty-four feet high; its petiolate leaves are heart-shaped, with three to five lobes. The blossoms of its stamens form panicles; the female cones stand either singly in the axils of the leaves or in clusters. In these cones a yellow, bitter resin, the hop-powder or lupulin, is secreted, which yields the wort for beer, and is also used by chemists. Hops are cultivated in almost all parts of Europe, especially in England, Germany and Austria. In the United States, California, Oregon, Washington, New York and Wisconsin produce the largest crops.

Hops are added to the malt, liquor, or wort before fermentation and give a bitter flavor to malt liquors. Hops are not exported on a large enough scale to be an important item in commerce.

Jute is an East Indian plant whose fibers are strong, coarse, dark in color and sometimes twelve feet long. The fibers are largely employed in the manufacture of coarse bagging and sacking called gunny cloth. Gunny bags, in which pepper, ginger, sugar, cotton, rice, gums, etc., are shipped are made of it. Jute is also largely mixed with silk, as it has a gloss that can scarcely be distinguished from silk when woven with it. Attempts have been made to manufacture paper out of jute, but it is difficult to bleach it white, and only a coarse kind of brown paper is obtained.

Licorice (*Glycyrrhiza*) is a plant having long, pliant, sweet roots, and generally creeping root-stocks; pinnate leaves of many leaflets, and terminating in an odd one; and whitish, violet-colored flowers in spikes, racemes, or heads. The roots of licorice depend for the valuable prop-

erties on a substance called *Glycyrrhizine*, allied to sugar, yellow, transparent, uncrystallizable, soluble in both water and alcohol, and forming compounds both with acids and with bases. They are a well-known article of materia medica, and were used by the ancients as in modern times, being emollient, demulcent, very useful in catarrh and irritations of the mucous membrane. It is a native of the south of Europe and of many parts of Asia, as far as China. It is cultivated in many countries of Europe. The only American species grows in the plains of the Missouri.

Ramie is the bast fiber from a plant (*Boehmeria nivea*), commonly called China grass, or rhea, although fibers from other plants sometimes receive these names. It is usually strong and silky in appearance but difficult to clean and bleach.

It is used largely in China for weaving grass cloth, or Canton linen. The fiber is very difficult to "de-gum." Many experiments have been made to find a satisfactory process. It is now used in making fabrics which resemble linen, laces, underwear, plushes, etc.

Raphia, a strong and useful fiber is obtained from the leaves of *Raphia Ruffia*, a palm cultivated in Madagascar, Mauritius, and neighboring islands, and of the Jupati palm, of Brazil. Madagascar raphia is the only important grade. A similar soft fiber used locally is produced in West Africa.

It is exported in considerable amounts from Madagascar and used by gardeners for tying plants; and also for making mats and basketry and in kindergartens.

Rattan is the stem of a species of climbing palm, natives of Asia, though some occur in Australia and in Africa. They have slender, reed-like but solid stems, seldom more than one or two inches in diameter, which grow to great lengths, clambering up among the branches of trees by means of the hooked pickles on the stalks of their leaves. The Indian and Malayan species are the source of the largely-imported rattan canes, used for the seats of chairs, and, in their native countries, for cables and a variety of other purposes.

Sisal (henequen or sisal hemp) is a hard, strong fiber from the leaves of a century plant (*Agave rigida*). It is cultivated in Yucatan and the Bahamas. Plantations of henequen, or maguey, have been established in Cuba, Hawaii, India, German and British East Africa and the Philippines. The home of the agave plants is Mexico and Central America and this part of the world produces most of these fibers.

On modern plantations machines have superseded the primitive hand methods of cleaning the fiber. Sisal is the chief product of Yucatan and its greatest export. The bulk of the production is used in the United States in making rope, twine and sacking. All of the other agave fibers are of less commercial importance than sisal or henequen.

The fiber of this species is especially valuable for ship cables, as it has been found to resist the action of sea-water better than most other materials.

Tobacco Plant (*Nicotiana tabacum*) is three to four feet in height; its leaves longish and lancet-shaped; its corolla pink; its fruit is a capsule, with many seeds. It is indigenous to America. Its leaves are either used for chewing, for smoking, or for snuff. It belongs to the poisonous plants, and contains no nutritious substance; its flavor and odor are disagreeable; nevertheless it furnishes much enjoyment to a large portion of mankind.

More tobacco is raised in the United States than in any other country and Kentucky raises more than any other state. India is the second largest producer. In Europe it is cultivated in Austria-Hungary, Russia, Germany, Netherlands, France, Belgium and Turkey. Cuba, Porto Rico, Mexico, Central and South America, China, Java, Sumatra, Philippines, Ceylon, Syria and Cape Colony are important producers.

Commercial grades are named from the locality of production as Havana, Sumatra, Mexican, Turkish, Virginia, etc. Certain grades are appropriate for use as cigar wrappers and others for fillers and are so named in the trade.

The United States exports over half of the tobacco raised, chiefly to England in the form of leaf tobacco. Few cigars are exported, but cigarettes and plug tobacco go to the East Indies, China and Australia.

IX. POISONOUS PLANTS

A number of plants contain so powerful a poison that we should take especial care to avoid them. As the danger may be better avoided by a general knowledge of these plants, a detailed description of them is highly desirable. Many of them are also important medicinal plants; and we should therefore by no means regret the existence of these poisonous growths; for, if we apply them to their proper uses, they serve to supply us with valuable medical aids.

Darnell (*Lolium temulentum*) is from eighteen to thirty-six inches high, and often found in cornfields. Its seeds contain a poison, which is narcotic and stupefying.

Deadly Nightshade (*Atropa Belladonna*) is common in the woods. The sappy stem is from three to six feet high; the egg-shaped leaves are covered with down; the brownish-red blossoms are arranged solitary in the axils of the leaves. The bright black berry is as large as a cherry. The nightshade is our most dangerous poisonous plant, and there is little hope for children who have eaten of its berries. From the fresh leaves atropine is prepared, which is a very powerful remedy in certain diseases of the eye.

Black Hellebore (*Helleborus niger*) blooms in December, January and February, and is a native of the mountainous woods of South Germany and Austria. The black root, which is white inside, is poisonous.

Fool's Parsley or Dog's Parsley (*Aethusa Cynapium*) is a common weed, growing in gardens, fields, and also on rubbish. It is easily mistaken for parsley. As it is very poisonous, it is well to remember that it can be easily recognized by three long pendent floral leaves on solitary umbels; the leaves are odorless, and only when crushed emit a faint, garlic-like scent.

Hellebore (*H. viridis* and *H. fœtidus*) is also rightly described as a poisonous plant. One species is used for killing lice and vermin on cattle, horses, and other live stock.

Henbane (*Hyoscyamus niger*) grows on rubbish and waste ground. The entire plant is covered with sticky hairs, and has a repulsive odor. The stem is about thirteen inches high; the longish leaves are widely serrated; the flowers are pale yellow, streaked with dark-violet veins; the fruit is a capsule, which opens with a spring lid. The henbane is also a dangerous, poisonous plant, but its leaves and seeds supply an important medicine.

Herb-Paris (*Paris quadrifolia*) grows in hedges and shady woods. On its upright stem there are four oval leaves. It has never more than one blossom, consisting of greenish-yellow petals, eight stamens, and one pistil. Its fruit is a dark blue, round berry, which ripens in July and August. The latter when eaten causes diarrhœa, convulsions and other disturbances.

Marsh Crow's-Foot (*Ranunculus sceleratus*) grows in ditches and marshes. The upright branching stem is from twelve to eighteen inches high; the leaves are divided in the shape of a hand, and the blossoms are small and yellow. The marsh crow's-foot contains very poisonous juices, which cause blisters and ulcers to rise on the skin, and when taken inwardly nearly always cause death. The other species of crow's-foot fount in meadows, fields, woods, etc., are also more or less poisonous.

Meadow Saffron (*Colchicum autumnale*) is a bulbous plant, which blooms in dry meadows in September and October. The flesh-colored blossoms appear in the autumn, and leaves are thrown up in the following spring; between the leaves are large capsules, each containing numerous seeds. The seeds and the bulbous root contain poison, and the former are used in medicine.

Mezereon (*Daphne Mezereum*) grows solitary in the woods. It is a tough plant, from one to three feet high; the lanceolate leaves are arranged in tufts at the end of the shoots; the rose-colored blossoms appear before the leaves, and are generally situated in clusters of three on the branches; the fruit is a red stone-fruit. The whole plant is poisonous; a medicine is prepared from the bark.

Purple Foxglove (*Digitalis purpurea*) is a common wild flower, and grows to a height of fifty inches. The longish leaves are felt-like, and the large purple flowers stand in a cluster; the fruit is a capsule. The purple foxglove is poisonous, and its leaves are used in medicine.

Spotted Hemlock (*Conium maculatum*) grows upon rubbish, hedges, fences, and highways. The stem is three to six feet high, marked with blue and bluish-red spots; the leaves are tripennate; the white blossoms also stand in flat umbels. The leaves when bruised emit a very peculiar mouse-like odor which is very noticeable on hot summer days. The root, especially, is poisonous, and when eaten causes the most fatal consequences. Hemlock is a powerful sedative, and is used medicinally.

Thorn Apple (*Datura Stamonium*) originally came from the East Indies, but is now widely spread, growing on rubbish and in gardens. Never more than a few plants are found. Its forked stem is from eighteen inches to three feet high; the petiolate leaves are widely serrated; the large blossoms are a pure white; the fruit resembles the horse chestnut, and contains numerous black seeds. The thorn apple has a very repulsive odor, a disagreeable flavor, and is poisonous in all parts. The leaves and seeds are used in medicines.

Water Hemlock (*Cicuta virosa*), is very common in many localities on the banks of streams, ditches, and in flooded fields; in other localities it is rare. The thick, fleshy root is hollow, and divided in the interior into sections; the upright stem is hollow and smooth; the leaves are tripennate; the small white blossoms are arranged in umbels of ten or more rays. The poison is chiefly contained in the red root, which, when eaten by children, who mistake it for an edible root, nearly always causes death, unless medical aid is immediately at hand. The other parts of the plant also contain a poison, which is so strong that its odor alone will produce headache and giddiness.

Wolf's-Bane or Monk's-Hood (*Aconitum Lycotonum*) is a rare plant from eighteen inches to three feet high; the leaves are shaped like a hand, with three, five or seven lobes. The blossom is yellow. The wolf's-bane contains a virulent poison, especially in the root and in the seeds. This description also applies to the *Aconitum Napellus*, which is grown as an ornamental plant in gardens; its tubers are used medicinally.

X. SOME WONDERS OF PLANT LIFE

We usually think of plants as quite harmless things, almost wholly at the mercy of the animal creation. This, however, is only one side of the story, for quite a number of plants have a very cunning plan whereby they entrap flies and other insects. The ingenuity with which these plants lure their victims on to death is simply amazing. Everything is done to tempt the creature to visit the death traps of the plants, and, on the other hand, no means are spared to make an escape impossible.

THE MOST CRUEL PLANT IN THE WORLD

One of the most singular instances of this is to be seen in a little plant which is only found growing in the bogs of the Carolinas. This has been rather cynically called the Venus Fly Trap (*Dionæa muscipula*), a fanciful name which hides its cruel practices. Few plants have adopted a more certain plan than the Dionæa. Every leaf which the plant produces is the most perfect device for the securing of prey that could be imagined.

The mechanical construction of this remarkable vegetable trap is somewhat on the following lines. The leaf is borne at the end of a curiously broad stalk, and is divided into two lobes; these are joined together by a hinge-like arrangement. The outside borders of the lobes are fringed with from a dozen to twenty long teeth. When fully expanded the leaf lies back on the moss amid which the plant grows.

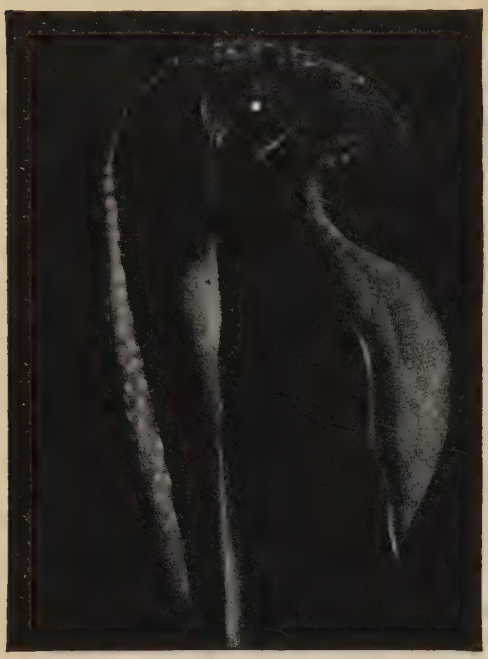
If we examine the inside surface of the lobes we shall see that these are in the middle colored a rosy red. Just at this point will be discovered three hairs arranged in triangular fashion.

It is interesting to consider the actual manner in which the plant carries out its fly-catching.

As is well known, bright colors have a great attraction for insects. In this case it is apparently the red areas on the lobes of the leaves which possess such an attraction for insects of all kinds. Possibly they secrete a sweet substance, but this is not definitely known. All goes on well as long as the creatures avoid doing one thing; unhappily, this they are almost certain to do sooner or later. Nothing happens unless the insect brushes up against one of the hairs previously mentioned as being on the surface of the lobes. The succeeding happenings are disastrous for the fly.

With really astonishing rapidity the sides of the leaf snap together so that the spines on the borders of the lobes meet. Thus, in a very brief time a most perfect little cage is devised from which any sort of escape is absolutely impossible. During the next half hour the sides draw in still closer.

CRUEL PLANTS THAT ENTRAP AND KILL ANIMALS



The light streaming through the transparent spaces induces the prisoner to waste its strength in a vain effort to escape through them.

Once below the inside edge, escape is almost impossible. Pitchers have been found almost full of flies and other insects.

Absorbed in the delights of feasting on the nectar of the Nepenthes, the insect wanders with fatal ease down the fluted rim.

The fruits of the Martynia fasten themselves to passing animals that sometimes get the hooks caught in their mouths and die a dreadful death.

so that the spines overlap. At this stage the leaf pours out a copious discharge of digestive fluid, which enables the plant to make use of the nutritious element in the fly.

After an interval of several days the leaf of the Dionæa opens and allows the hard carcass of the fly to roll away. The plant is then ready for another meal, and unable to realize the fate which is in store for it, another fly falls a victim. Quite often the Venus Fly Trap is able to capture large insects.

THE STRANGE HABITS OF THE NEPENTHES

Scattered over the tropics of the old world there is a remarkable group of plants known as Nepenthes. Many of these are of a climbing habit, rooting in bark crevices where a little moist soil may have collected. To augment their food supply they have produced pitchers, which in some species are of great size. Indeed, in one kind of receptacles will hold as much as two quarts of water. In all cases these pitchers have a thick, corrugated rim, and it is this which plays a big part both in the luring and the capturing of the insects. On this rim, as well as on the lid of the pitcher, there are honey secreting glands, and these, of course, make the strongest appeal to hungry insects.

Absorbed in the delights of the feast, the insect wanders with fatal ease down the fluted rim. Once below the inside edge of this, escape is almost impossible, for the border is adorned with sharp, teeth-like processes, all pointing downward to the pit of destruction. Moreover, the inside walls of the pitcher are specially smoothed with a wax-like secretion, which makes climbing up a very difficult feat. Even insects with wings seem to find a great difficulty in making good their escape.

The pitchers of the Nepenthes are usually about half filled with fluid; this is not entirely collected rain or dew, but is largely formed by a definite secretion of the plant. Into this fluid the exhausted insect tumbles sooner or later, there to end miserably among a mass of drowning victims. It has been definitely proved that this fluid is an acid secretion—not unlike the digestive juices of an animal—which enables the plant to extract the nutriment it needs from the bodies of its victims.

THE NEPENTHES CATCH EVEN MICE AND BIRDS

It is in connection with the fluid contained in the pitchers of the Nepenthes that these plants catch much larger prey than insects. In the tropics it is not always an easy matter for birds and other small animals to secure a drink readily. The half-filled pitchers entice many a small creature to creep over the fluted rim in order to secure a draught of the fluid, which is not unpleasant to the taste. Now and again the venturesome visitor loses his hold and tumbles into the pitcher. Even in the case of mice and small birds the pitcher proves a veritable death-trap. The slippery sides are almost insurmountable, while the sharp hooks round the rim still further check an escape. Sooner or later the victim falls back into the fluid and is drowned. Strange as it may appear, after such a capture the plant grows vigorously, for the decaying body of its victim is rich in just the food material of which it stands in need.

THE DEATH PITCHER OF THE SARRACENIAS

A very singular group of plants, the Sarracenias, are quite common in the bogs of North America. These are of an elegant shape, and may be as much as one foot or two feet in height. Nearly always they are highly colored, and altogether so attractive do they appear that insects of all kinds simply crowd to them. On arrival at the lip of the pitcher, the insects find a feast of honey spread out for their delectation. With almost devilish ingenuity this becomes sweeter and more plentiful the farther down into the pitcher one traverses. At a certain point, however, the nectar ceases, and the insect thinks that he will retrace his steps. But although it has been easy enough to go down, it is almost impossible to get back, for the surface of the inside of the pitcher is thickly covered with sharp bristles, all pointing downward.

Some flying insects may escape, but even these do not find it easy, as witness the fact that the plant often catches a large number of winged creatures. In the lower part of the Sarracenia pitcher a fluid is secreted, and it is into this that the creatures ultimately fall, and, of course, perish. How successful are the Sarracenias in their insect-catching may be gathered from the fact that pitchers have been discovered well nigh full of flies and other small creatures.

A PLANT WITH PRISON WINDOWS

The California Darlingtonia seems to have been specially devised for the securing of winged creatures. The plant is most singular in appearance, and the upper part of the pitchers bear a remarkable resemblance to the head of a snake. Part of the hood and also the two protruding leaves are gaily colored in crimson. It should also be noted that the upper portion of the hood is adorned with transparent patches, like so many little windows. Now, the only opening into the pitcher of the Darlingtonia is quite a small hole on the under side of the hood. As in the case of the other pitcher plants, the orifice of this hole is freely supplied with honey, and this extends well into the interior of the receptacle.

Owing to the attraction of the little windows, which have been already mentioned, the flies do not attempt to get out of the hole to the extent which might be supposed. The light streaming through the transparent spaces seems to convince the insects that in that direction lies the path to freedom. At all times it is possible to see perhaps a dozen flies bobbing against the windows in a vain endeavor to escape. Finally, wearied to death by their hopeless endeavors to escape, the insects fall down into the lower part of the pitcher and become suffocated by the fluid it contains.

AN AUSTRALIAN PLANT WITH TWO KINDS OF LEAVES

A curious little Australian plant which has adopted a very similar plan of fly catching to that to be seen in the Nepenthes is the Cephalotus. One singular feature about this Australian pitcher plant is that it produces quite ordinary leaves in addition to the highly specialized fly-catching ones.

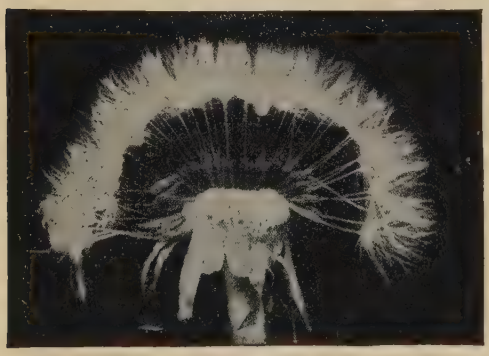
PLANTS THAT KILL EVEN THE POWERFUL LION

The Martynias of South America produce fruits with hooks sometimes five or six inches in length,

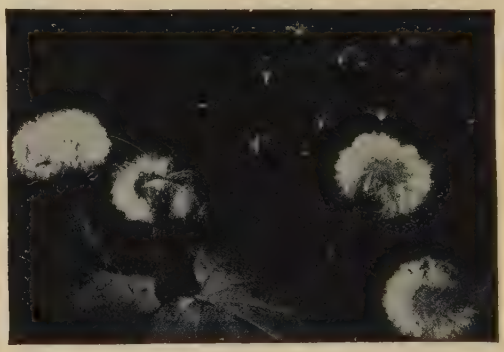
The pretty little parachute-like device of the Dandelion seed which helps to waft it over a wide area. It often rises to a height of thirty feet, and is wafted many miles away.

The Willow Herb produces an enormous number of flying fruits. These often sail away in masses and are carried for a great distance over the countryside, to take root in a new location.

The seed of the Sycamore is provided with a long wing. These wings revolve quickly when the heavy seed is falling, prevent a rapid decent, and help to scatter them.



The head of a seeding Dandelion. Observe the enlarged view of one of the parachutes above.



When the fruits of the Coltsfoot are ripe the smallest puff of air disperses the seed far and wide.

which get imbedded into the flesh of animals. The African Grapple-plants (*Harpagophyton procumbens*) are even worse in the amount of suffering which they cause; thousands of antelopes, goats, and other creatures are lamed by them every season. The seed vessel of this plant is provided with a large number of curved hooks by which it attaches itself to the coats or hoofs of animals and is thus transported from place to place. It has been known to choke and cause the death of lions.

HOW PLANTS TRAVEL

Many plants provide their seeds with an apparatus which forms a singularly effective flying machine. Some of these are among the most beautiful and ingenious contrivances in the plant world.

NATURE'S AVIATORS AND SEED-SOWERS

By far the commonest method of ensuring a wide distribution of a seed is that in which the object is attached to some light, feathery substance which prevents a speedy falling. Of this there is no better instance than the common dandelion, which at seed time produces the handsome "clock" so prized by the children.

Here each seed is attached to a feathery process which plays the part of a parachute. On a dry day, when the dandelion heads are parting with their fruits, we may see how well the scheme works. Each puff of wind releases a few of the seeds, and these, unlike the ordinary parachute with a load, are so light that they rise upwards on the air currents.

Curiously enough, the fruits seem to travel farther when the breezes are light, and a very rough wind blows them back to earth, where they may catch in the grass or become damaged. Thus, like the airman, the dandelion seed stands the best chance of a safe journey when the weather is not too boisterous.

A very similar arrangement is to be seen in the case of the goat's-beard fruit and that of the coltsfoot, which, by reason of its flying device, secures a very wide distribution.

THE WILLOW ALSO PRODUCES FLYING SEEDS

After flowering the Willow Herb develops long, pod-like processes. During damp and stormy weather these pods remain tightly closed. On a day when the air is dry and the breezes are light, the sides of the case split open and reveal a prodigious number of perfect flying machines. The seed itself weighs a mere trifle, and to this is attached a beautiful arrangement of feathery hairs. The whole thing is so well adapted for an aërial voyage that it mounts rapidly upward on the faintest puff of air. It should be here explained that by experiment it has been shown that the air currents tend to move upward. So light are some of these flying fruits that they often rise to an immense height. It is not an uncommon thing for them to be found on mountains thousands of feet above sea-level.

Of course, many foreign seeds have remarkable flying appendages. That of the South African Stapelia has a vast mass of fluffy hairs which will support it on quite a long aërial voyage. In the case of the cotton plant man has turned to good account the hairs by which the seed flies.

SEEDS OF THE SYCAMORE A DIFFERENT TYPE OF FLYING MACHINE

In a large number of cases the conveyance of the seeds to a distant point is accomplished by the adoption of the screw-propeller principle. An excellent example of this is to be seen in the fruits of the sycamore. Here the actual seed is large and heavy, but it is attached to a wing-like expansion. When the fruit falls from the tree the wing revolves with great rapidity, very much on the lines of a propeller blade. This has the effect of controlling the rate of fall, so that the whole contrivance is carried to some distance before the seed is actually brought to earth.

PLANT TRAVELERS ON LAND

Some kinds of touring plants send out long trailing stems to search for fresh rooting places. A little Alpine saxifrage is curious in this respect, for the plant will traverse over many feet of barren rock to reach a suitable position. Directly the shoot touches the soil, a new plant is formed, and as this grows up, the connection between it and the parent is severed. A kind of lily has an even more singular way of traveling about. Here, after the plant has flowered, buds arise on the stems which bore the blossoms. Eventually they take root in fresh positions. This plant if left alone would rapidly cover many yards with its offspring, and this without setting a single seed.

A strange group of plants are those which actually break themselves in pieces in order to pursue their journeys abroad. A plant belonging to the Houseleek order (*Sempervivum soboliferum*) is remarkable in this respect. The species naturally finds its home in the crevices of rocks, and at a certain stage in its development numerous little ball-like offshoots are produced. In the early days these are kept at home by the stems by means of which they are attached to the parent plant. Eventually these attachments shrivel up and the offshoots go rolling away over the rocks often much helped in their journey by the wind. A considerable distance may be traversed before a little ball finds a resting-place in some niche.

HOW THE CACTUS PROTECTS ITS FLOWERS

HOW THE PLANTS DEFEND THEMSELVES

It is well-known to every intelligent observer that plants are menaced by a host of enemies. Though the plant cannot take up the aggressive to any extent, the weapons which it employes in its own defense are of an exceedingly efficient nature. In their way they are quite as effective as anything that animals employ in their battle for existence.

Among the commonest defenses of the plant are spines, thorns and prickles. In the sloe (*Prunus spinosa*), for example, the spines are modified branches; in gorse (*Ulex Europæus*) they are branches and leaves; and in cacti the green parts are thickened stems and the spines reduced leaves; while in holly (*Ilex aquifolium*) the prickly leaves answer the purpose of spines. The stinging hairs of the nettle which exude an irritating acid when touched are a familiar example of protection against vegetarian animals.

The way in which seeds are protected by spines is well illustrated in the case of the Sweet Chestnut. Here it would be a very knowing animal that could open one of the cases before they split naturally with the ripening of the seed.

HOW THE CACTUS DEFENDS ITS LIFE

There are few plants so well armed as the Cactus, the evident design of which is to conserve its moisture. This is accomplished in several ways. Of course, the very shapes of the plants are all in their favor. Being either round, globular, or cylindrical, they offer a limited surface to the dry air inconceivably less than a plant of the same size bearing a quantity of leaves. The thick skins, too, play a big part in keeping in the moisture, and many kinds of cacti, such as that known as Old Man's Beard, are covered with dense masses of hair.

Many of these succulent desert plants grow to a great size. Thus the Giant Cactus sends up a tall column, often with only a very few branches, which may be eighty or even one hundred feet in height.

Curiously enough, some cacti produce the most beautiful flowers, blossoms without rival in the whole world. The various kinds bear flowers of every conceivable shade except blue, and the blooms are often of an immense size. It is not unusual for the blossoms to measure eighteen inches, or even two feet, across.

Living as they do in arid regions, cacti are peculiarly liable to be attacked by thirsty animals. Now, a common mode of defense is the covering of the plant with sharp spines. These spines are so arranged that they completely shield the juicy stem from any possibility of attack. it is said that on occasion Mexican ponies will try to knock a cactus to pieces with their heels when they are thirsty. More often than not the animals suffer cruelly for their temerity by being severely pricked.

In much the same way the Aloes and Agaves are protected, so that a hedge of these plants when placed round a field, is better than the most perfect barbed wire fence.

THE AMERICAN AGAVE, OR "CENTURY PLANT"

This plant is remarkable for its beauty, and grows to a height of twenty to thirty-five feet. It was long popularly supposed to bloom only once in a century; hence the name. Though this is a mistaken idea, the vegetative growth of the plant is many years. The plant produces flowering stems, sometimes several feet in height, ultimately terminating in a large panicle of flowers and dying of the effort. A single plant may produce five thousand flowers, so that the ground beneath is wet with the honey distilled by them. The fiber of the leaves was used by the ancient Mexicans for paper parchment, and is now largely exported for that purpose and for cordage.

THE CURIOUS MISTLETOE, A ROBBER PLANT OR PARASITE

The mistletoe is one of the most interesting of the parasite plants. It grows on various trees, and is celebrated on account of the religious purposes to which it was consecrated by the ancient Celtic nations of Europe. It is a small shrub, with oblong, somewhat leathery leaves, and small yellowish-green flowers, the whole forming a pendent bush, covered in winter with small white berries, which contain a glutinous substance. It is common enough on certain species of trees, such as appel and pear trees, hawthorn, maple, lime, and other similar trees, but is very seldom found on the oak. Its roots penetrate into the substance of the tree on which it grows, and though it may live for forty years, it finally kills the branch supporting it.

In days of old the mistletoe was looked upon with awe as a mysterious and wonderful plant. The ancient Druids held it sacred, and cut it down with a golden sickle with all sorts of strange, mystic rites. It was the symbol of peace and friendship; and that is why we hang it up at Christmas time, and when two people meet under its green leaves, they are expected to "kiss and be friends."

A PLANT THAT GROWS IN SNOW

Strangest of all the plants is the Soldanellas, a small species which exists on the lower slopes of the Alps. When the flower stems are in their most active state of growth they release a considerable amount of heat. In this way they will bore a course up through a thick coating of ice and snow to the light and air above, when by some means the plant is aware that the spring has arrived. There seems to be something more wonderful in this than can be explained by mere mechanical causes. Indeed, the sympathy of the plant with its surroundings is surely one of those mysteries which are as inscrutable as life itself.

THE PRIMARY USE OF LIQUID RUBBER TO PLANTS

The grubs of many beetles live in wood, upon which they feed. This probably gives a clue to the primary use of the important commercial substances india-rubber and guttapercha, which are the dried sticky juices of various shrubs and trees growing in hot climates. Beetles of the wood-boring kind, which seek to pierce and lay eggs in such plants, are liable to be snarled and killed by the viscid fluids which ooze out.

Arums, and various other plants, ward off the attacks of snails and slugs in a rather curious way. The outer parts of their stems and leafstalks contain bundles of excessively sharp crystals (*raphides*), composed of oxalate of lime. These pierce the soft mouths of snails and slugs like so many needles, conveying a lesson which usually needs no repetition.

STRANGE LIFE HABITS OF UNUSUAL PLANTS

The Giant Cactus of the American Desert
These plants are little more than succulent stems, covered with a thick skin which retains the moisture of the juicy shoot.

The Century Plant
The Century Plant is a native of Mexico, and is remarkable for the long intervals between the blooming periods—once erroneously thought to be 100 years.

CHRISTMAS ROSE IN WINTER

In defiance of the weather a few plants elect to come into bloom right in the middle of winter. The most striking of these is the Christmas Rose, or Hellebore. The flowers of this plant are protected by the encircling sepals, and are fully able to hold their own until the approach of a more favorable season.

SCIENTIFIC TERMS USED IN BOTANY

Completely Classified, Illustrated and Exemplified

ROOTS.

Kinds. — (1.) PRIMARY, growing from root-end of embryo.

(a.) SIMPLE. — *Conical*, ; *napiform*, ; *fusiform*, .

(b.) MULTIPLE. — *Moniliform*, necklace-like. *Fasciculated*, tufted, thick and fleshy *Tubercular*, having small tubers. *Fibrous*, thread-like.

(2.) SECONDARY, growing from stems.

Underground, starting from stem below ground. *Aerial*, starting from stem above ground.

STEM.

Parts. — *n*, *Node*, part to which the leaf is fastened.

i, *Internode*, portion between nodes.

a, *Axil*, the angle between leaf and stem, upper side.

Class. — *Exogenous*, outside-growing (Maple, Elm).

Endogenous, inside-growing (Corn-stalk, Timothy).

Situation. — (1.) *Above ground*, usually leaf-bearing.

(2.) *Under ground*, scale-bearing.

Stems above Ground.

Character. — *Herbaceous*, soft, not woody (Four-o'clock).

Suffrutescent, slightly shrubby (Toad-flax).

Suffruticous, shrubby at base (Trailing Arbutus).

Fruticous, shrubby (Currant-bushes).

Arborescent, tree-like (Flowering Dogwood).

Arboreous, tree (Elm).

Direction of Growth. — *Repent*, prostrate and rooting from the under surface (Partridge-berry).

Procumbent, prostrate, but not rooting (Purslane).

Decumbent, prostrate, except at the extremity (Poor Man's Weather-glass).

Assurgent, ascending obliquely.

Erect, upright (Indian Corn).

Scandent, climbing with tendrils or rootlets (Grape, English Ivy).

Voluble, twining (Morning-glory).

Declinate, declined or bent downwards (Blackberry).

Diffuse, loosely-spreading (Red Currant).

Forms of Branches. — *Sucker*, a branch of subterranean origin that finally rises out of the ground. The Raspberry multiplies in this way.

Offset, a short, prostrate-rooting branch with a tuft of leaves at the end (Houseleek).

Runner, a long, prostrate-rooting branch with tuft of leaves (Strawberry).

Stolon, a branch that curves downward and takes root. The Currant multiplies in this way

Tendril, a thread-like coiling branch used for climbing.

Spine or *Thorn*, a hard, sharp-pointed branch.

Stems under Ground.

Kinds. — *Rhizoma* or *Rootstock*, a perennial, horizontal stem, partially or wholly subterranean (Calamus).

Tuber, an enlarged stem with eyes (White-potato).

Bulb, a bud, usually subterranean with fleshy scales (Onion, Lily).

Corm, a solid bulb (Indian Turnip).

LEAVES.

Parts. — *b*, *Blade*, the expanded portion.

p, *Petiole*, the stem.

s, *Stipules*, leaf-like appendages at base of petiole.

Kinds. — (1.) SIMPLE, having but one blade.

Sessile, without petiole

Petiolate, with petiole.

Stipulate, with stipules.

Cirrhous, with tendril

(2.) COMPOUND, having more than one blade.

(a.) *Pinnate*, with leaflets arranged along a common petiole.

Abruptly pinnate, with even number of leaflets.

Odd-pinnate, having an odd leaflet.

Unipinnate, divided but once.

Bipinnate, divided twice.

Tripinnate, divided three times.

(b.) *Palmate*, leaflets diverging from one point.

Unipalmate, divided but once.

Bipalmate, divided twice.

Tripalmate, divided three times.

Framework. — *Midrib*, the central vein.

Ribs, strong veins branching from near the base of midrib.

Veins, the branching framework.

Veinlets, small veins.

Venation. — *Parallel*, with simple veins running parallel from base to apex.

Feather, with lateral veins branching at regular intervals from midrib.

Radiate, with strong veins branching from apex of petiole.

Reticulate, with veins and veinlets that unite and separate in the form of network.

Form. — (a.) BROADEST AT THE MIDDLE. — *Peltate*, ; *orbicular*, , *oval*, ; *elliptical*, ; *oblong*, ; *linear*, , *acerōse*, (Pine).

(b.) BROADEST AT BASE. — *Deltoid*, , *ovate* , *lanceolate*, , *subulate*, , *cordate*, , *reniform*, ; *hastate*, ; *sagittate*, .

(c.) BROADEST AT THE APEX. — *Obovate*, ; *oblanceolate*, , *spatulate* , *cuneate* , *obcordate*, *lyrate*, , *runcinate*, .

Bases. — *Auriculate*, ; *oblique*, , *tapering*, ; *abrupt*, ; *clasping*, ; *perfoliate*, ; *connate*, ; *decurrent*, .

Apexes. — *Obcordate*, , *emarginate*, ; *retuse*, ; *truncate*, ; *obtuse*, ; *acute* ; *acuminate*, ; *mucronate*, ; *cuspidate*, ; *aristate*, .

Margins. — *Entire*, , *repand*, ; *sinuate*, *crenate*, ; *dentate*, ; *serrate*, ; *incised*, ; *laciniate*, , *palmately-lobed*, ; *palmately-cleft*, , *palmately-parted*, ; *palmately-divided*, ; *pinnately-lobed*, ; *pinnately-cleft*, ; *pinnately-parted*, ; *pinnately-divided*, .

Surface. — (a.) WITHOUT HAIRS. — *Glabrous*, smooth.

(b.) SOFT HAIRS. — *Pilous*, few, short; *hirsute*, few, long; *pubéscent*, dense, short; *villous*, dense, long; *seríceous*, silky; *lanūginous*, woolly; *toméntous*, matted like felt; *flóccous*, fleecy tufts.

(c.) STIFF HAIRS. — *Scābrous*, minute, hard points; *hispid*, few, short points; *sētous*, bristly; *spinous*, having spines.

Color. — *Glaucous*, covered with whitish powder.

Canéscent, grayish-white with fine pubescence.

Incānous, hoary-white.

Punctate, having transparent dots.

Hýaline, nearly transparent.

Texture. — *Succulent*, fleshy; *coriaceous*, leather-like; *scarious*, dry; *rúgous*, wrinkled.

Phyllotaxis, arrangement on the stem. — *Alternate*, ; *opposite*, ; *whorled* (verticillate); *radical*, near the ground; *cauline*, on the stem; *rosulate*, clustered; *fasciculate*, in bundles.

Vernation, arrangement in the bud.

Induplicate, folded crosswise (Tulip-tree).

Conduplicate, folded along midrib (Oak).

Plicate, folded like a fan (Red-currant).

Circinate, rolled lengthwise (Fern).

Convolute, rolled edgewise (Cherry).

Involute, both edges rolled inward (Apple).

Revolute, both edges rolled outward (Willow).

Equitant, astraddle (Iris).

Obvolute, half equitant (Jerusalem Sage).

Triquētrous, triangular equitant (Sedges).

Duration. — *Fugacious*, falling very early.

Deciduous, falling at the close of the season.

Persistent, remaining through the winter

INFLORESCENCE.

Parts. — *Flower*, the blossom

Peduncle, the stem of a solitary flower or the main stem of a flower-cluster

Scape, a peduncle that grows from the ground.

Pedicel, , *p*, the stem of each flower of a flower-cluster.

Bracts, *b*, small floral leaves.

Involucre, a cluster of bracts.

Kinds. — (1.) SOLITARY, single, alone.

Terminal, at the summit of the stem.

Axillary, in the axils of the leaves.

(2.) CLUSTERED, several flowers collected in a bunch.

(a.) INDEFINITE or INDETERMINATE, flowering from axillary buds. Inflorescence centripetal.

FLOWERS PEDICELLATE.

Racēme, flowers arranged along the axis; pedicels about equal in length (Currant).

Córymb, same as raceme, except that the lower pedicels are elongated, making the top flat (Hawthorn).

Umbel, same as corymb, except that the pedicels branch from about the same point (Milkweed).

Panicle, compound raceme (Blue-grass).

Thyrsus, a compact panicle (Lilac).

FLOWERS SESSILE.....

Spike, same as raceme with flowers sessile (Mullein).

Spādix, a fleshy spike, generally enveloped by a large bract called a *Spāthe*, (Calla Lily).

Ament or *Catkin*, a slender pendent spike, with scaly bracts (Birch).

Head or *Capitulum*, a shortened spike, reduced to a globular form (Clover).

(b.) DEFINITE or DETERMINATE, flowers all terminal. Inflorescence centrifugal.

Cyme, flat-topped or rounded inflorescence (Elder).

Fascicle, a compact cyme (Sweet-William).

Glomerule, a cyme condensed into a head (Mint).

Verticillaster, two opposite glomerules joined (Motherwort).

Scorpioid, a one-sided and coiled cyme (Forget-me-not).

FLOWER.

Parts. — *Receptacle*, the part upon which the several organs of the flower are inserted.

Calyx, the exterior floral envelope.

Corolla, the interior floral envelope. The calyx and corolla constitute the *protecting organs*, sometimes called *perianth*.

Stamens, the fertilizing organs.

Pistils, the seed-bearing organs. The stamens and pistils constitute the *essential organs*.

Kinds. — *Symmetrical*, same number in each set of organs; *unsymmetrical*, different number.

Complete, all the sets present; *incomplete*, some sets wanting.

Regular, sepals and petals uniform; *irregular*, sepals or petals unlike.

Perfect, stamens and pistils both present; *imperfect*, one set absent.

Staminate, with stamens only; *pistillate*, with pistils only; *neutral*, with neither.

Monœcious, staminate and pistillate on same plant; *diœcious*, on different plants.

Dichlamýdeous, having calyx and corolla; *monochlamydeous*, having calyx only; *achlamydeous*, having neither.

Di, *trí*, *tetrá*, *pentá-merous*, two, three, four, or five parts in each set.

Sessile, without peduncle; *pedunculate*, with peduncle.

DEVIATIONS FROM THE NORMAL OR PATTERN FLOWER ARISE FROM

Augmentation, increase of floral circles (Water Lily).

Cherisis, increase of organs by division. The Bleeding-heart shows the *collateral chorisis* of stamens, and the Catchfly shows the *transverse chorisis* of corolla.

Anteposition, parts opposite instead of alternate (Grape).

Cohesion, union of parts of the same set (corolla of Morning-glory).

Adnation, union of different sets. In the Cherry the stamens and corolla are inserted upon the calyx.

Irregularity, parts of the same set unequally developed (Violet, Pea).

Suppression, non-development of some parts. In the mints some of the stamens are suppressed or wanting.

CALYX.

Parts. — *Sepals*, the divisions of the calyx.

Tube, the united portion of a gamosepalous calyx.

Teeth or *lobes*, the distinct or divided portions of a gamosepalous calyx.

Throat, the orifice or summit of the tube.

Pappus, in Compositæ, the calyx border consisting of scales, teeth, bristles, or slender hairs.

Cohesion. — *Gamosepalous* or *Monosepalous*, sepals partially or wholly grown together.

Truncate, without lobes.

Toothed, lobes small.

Lobed, parted about one fourth.

Cleft, parted about one half.

Parted, separated nearly to the base.

Polysepalous, separated to the base.

Adnation. — *Inferior*, calyx free from ovary.

Half-inferior, calyx adherent to the ovary half-way.

Superior, calyx adherent to the ovary.

Form. — See under COROLLA.

Æstivation. — See under COROLLA.

COROLLA.

Parts. — *Petals*, the divisions of the corolla.

Lamina, the expanded portion of the petal.

Claw, the stem portion of the petal.

Spur, *s*, the hollow portion of certain corollas.

Crown, a small projection from certain petals (Catchfly).

Cohesion. — *Gamopetalous* or *Monopetalous*, petals partially or wholly grown together.

Truncate, *toothed*, *lobed*, *cleft*, *parted*.

Polypetalous, petals separate.

Adnation. — *Hypógynous*, corolla attached under the pistil (*gynia*, pistil).

Perígynous, corolla attached to the calyx. It is thus around the pistil.

Epígynous, corolla attached to the ovary. It is thus upon the ovary which is a part of the pistil.

Form. — GAMOPETALOUS and POLYPETALOUS.

GAMOPETALOUS.
- REGULAR.
  - *Urceolate*, urn-shaped (Whortleberry).
  - *Tubular* cylindrical (Trumpet Honeysuckle)
  - *Campánulate*, bell-shaped (Harebell).
  - *Infundibular*, funnel-shaped (Morning-glory).
  - *Hypocraterimórphous*, salver-shaped (Phlox).
  - *Rotate*, wheel-shaped (Potato).
- IRREGULAR.
  - *Ligulate*, strap-shaped (Dandelion).
  - *Lābiate*, two-lipped.
    - *Gāleate*, upper lip arched (Catmint).
    - *Ringent*, both lips arched (Dead-nettle).
    - *Personate*, throat closed (Toad-flax).

POLYPETALOUS.
- REGULAR.
  - *Rosāceous*, petals without claws (Rose).
  - *Liliāceous*, petals with claws gradually spreading (Lily).
  - *Caryophyllāceous*, long claws enclosed in a tube (Pink).
  - *Crucíferous*, four clawed petals in the form of a cross (Mustard).
- IRREGULAR.
  - *Papilionāceous*, butterfly-shaped (Bean).
    - PARTS. — *Vexillum*, banner; *alæ*, wings; *carīna*, keel.

Æstivation, the arrangement of the floral organs in the bud.

Valvular, pieces met by their margins (Lilac).

Induplicate, margins turned inward (sepals of Clematis).

Reduplicate, margins turned outward (sepals of Hollyhock).

Convolute, or *contorted*, each piece overlaps its neighbor in one direction (Geranium).

Imbricated, one or more petals wholly outside.

Quincúncial, five petals, two without and two within and the remaining one with one edge outside and the other inside.

Triquētrous, three petals, one without and one within, and the remaining one with one edge outside and the other inside.

Véxillary, having one large petal enclosing the others (Pea).

Plicate, the folding of gamopétalous flowers.

Supervolute, with folds turned obliquely in the same direction (Morning-glory).

STAMENS (ANDRŒCIUM).

Parts. — *Anther*, the enlarged and essential portion.

Filament, the stem holding the anther.

Pollen, the fertilizing powder found in the anther.

Kinds. — *Sessile*, anther without filament.

Sterile, filament without anther.

Connivent, converging.

Exserted, protruding out of corolla.

Included, entirely within the corolla.

Didýnamous, four in number, two long and two short.

Tetradýnamous, six in number, four long and two short.

Cohesion. — *Syngenesious*, united by their anthers.

Monodelphous, united by their filaments into one set.
Diadelphous, united into two sets.
Polyadelphous, united into many sets.

Adnation. — *Hypógynous*, borne on the receptacle.

Perígynous, borne on the calyx.

Epipétalous, borne on the corolla.

Alternate, alternate with the lobes.

Opposite, in front of the lobes.
Epigynous, borne on the ovary at its summit.
Gynándrous, borne on the style (Orchid).

FILAMENT.

Kinds. — *Filiform, subulate, dilated, petaloid, bidentate.*

ANTHER.

Parts. — *Lobes* (*thecæ*) and *connective.*

Adnation. — *Innate*, anther firm on summit of filament.

Adnate, anther attached by its whole length to filament.

Extrórse, facing the petals.
Intrórse, facing the pistils.

Versatile, attached near the middle.

Dehiscence. — *Longitudinal*, opening lengthwise.

Transverse, opening crosswise.

Porous, opening by terminal holes.

Valved, opening by valves or doors.

PISTILS (Gynœcium)

Parts. — *Stigma*, the rough end to which the pollen adheres.

Style, the stem holding the stigma.
Ovary, the enlarged portion containing the ovules.

Cohesion. — *Simple*, having but one cell, placenta style and stigma.

Multiple, a collection of simple pistils (Blackberry).

Compound, simple pistils grown together, each called a *carpel.*

STIGMA.

Kinds. — *Sessile*, stigma on ovary; no style.

Globose, globular (Four-o'clock).

Capitate, broad and flat.

Lobed, rounded.
Feathered, like a feather (Grasses).
Linear, thread-like (Corn).

STYLE.

Kinds. — *Basal*, attached to base of ovary (Forget-me-not).

Lateral, attached to side of ovary (Strawberry).

Terminal, attached to top of ovary.

OVARY.

Parts. — *Placentæ*, the parts to which the ovules are attached.

Dissepiments, partitions.

Cells, cavities in which the ovules are arranged.
Ovules, unfertilized seeds.

Adnation. — *Inferior*, calyx adherent to ovary, same as superior calyx.

Superior, calyx free from ovary, same as inferior calyx.

Placentation. — *Free-central*, ovules attached to a central column in a one-celled ovary (Pink).

Axillary, ovules attached to a central column in a compound ovary.

Parietal, ovules attached to the outer walls of the ovary.

OVULE.

Parts. — *Nucleus*, *n*, the essential part in which the embryo is formed.

Primine, *p*, the exterior coat.
Secundine, *s*, the interior coat.
Micropyle, *m*, the opening of the ovary coats.
Funiculus, the stem to which the ovule is attached.
Hilum, *h*, the point of attachment on the ovule.
Chalāza, *c*, the place where the coverings and nucleus join
Rhāphe, *r*, the connection between the hilum and the chalaza.

N. B. — Through the funiculus, the rhaphe, and the chalaza the ovule receives its nourishment from the placenta. Through the micropyle it receives the tubular prolongation of the pollen.

Kinds. — *Orthótropous*, straight; no change in direction of parts (Buckwheat).

Campylótropous, curved; the micropyle brought near the chalaza (Bean).

Anátropous, inverted: the micropyle brought near the hilum, pointing to the placentæ. Rhaphe the whole length of the ovule (Magnolia).

Amphitropous, half inverted; short rhaphe (Mallow).

Direction of Ovary. — *Erect*, ; *ascending*, ; *horizontal*, ; *pendulous*, ; *suspended*, .

FRUIT.

Parts. — *Seed*, the part containing the embryo.

Pericarp, the covering of the seeds, including the ovary and all adnate parts. The parts of the pericarp are *epicarp*, or outer coat; *mesocarp*, or middle coat; and *endocarp*, or inner coat.

Dehiscence. — *Septicīdal*, opening of the partitions.

Loculicīdal, opening at the dorsal suture.

Septifragal, valves falling away from partitions.

Circumcissile, opening by a circular horizontal line.

Kinds. — *Simple*, *aggregate*, *accessory*, *multiple*.

(1.) SIMPLE FRUITS. — *Fleshy*, *Stone*, *Dry* (formed by a single pistil).

(a.) FLESHY FRUITS. — Indehiscent (with two or more seeds).

Seeds immersed in a pulpy mass.
- *Berry*, rind membranous (Grape).
- *Hesperídium*, rind leathery, separable (Orange).
- *Pēpo*, rind hard (Cucumber).

Seeds in cells. — *Pome*, succulent calyx (Apple).

(b.) STONE FRUITS. — Indehiscent; one-celled; endocarp hard.

Drupe, three-coated; stone-cell entire (Peach).

Tryma, two-coated; stone-cell two-parted (Walnut).

Etærio, an aggregation of drupes (Raspberry).

(c.) DRY FRUITS. — Indehiscent, usually one seed with one coat.

Achēnium, coat separable from seed (Dandelion).

Utricle, coat inflated (Goosefoot).

Caryópsis, coat inseparable (Wheat).

Glans, invested with a *cūpule*, (Acorn).

Samāra, having winged appendages (Maple).

(c'.) DRY FRUITS. — Dehiscent.

Single pistil.....
- *Follicle*, opening by a ventral suture (Columbine).
- *Legūme*, opening by both sutures (Bean).
- *Loment*, jointed legume (Desmodium).

Compound pistil.
- *Capsule*, any compound dehiscent fruit.
- *Silique*, a two-valved capsule (Mustard).
- *Silicle*, a short silique (Shepherd's Purse).

Pyxis, circumscissile dehiscence (Purslane).

(2.) AGGREGATE FRUITS, . A cluster of carpels on one receptacle taken as a whole (Raspberry).

(3.) ACCESSORY or ANTHOCARPOUS FRUITS. — Those of which the most conspicuous portion, although appearing like a pericarp in some cases, does not belong to the pistil (Rose-hip).

(4.) MULTIPLE or COLLECTIVE FRUITS. — Those which result from the aggregation of several flowers into one mass (Pine-apple, Mulberry).

Stróbile or *Cone*, a scaly multiple fruit, resulting from the ripening of some kinds of catkins (Hop, Conifers).

Gálbalus, a closed cone (Juniper-berry, Red Cedar).

SEED.

Parts. — *Integuments*, seed-coats. *Nucleus*, part containing the embryo.

(1.) PARTS OF INTEGUMENTS:

Testa (*episperm*), the outer or proper seed-coat.

Tegmen (*endopleura*), the inner coat, sometimes wanting.

Funículus Hilum (*h*), *Chalāza* (*c*), *Rhāphe* (*r*), are the same as in ovule.

Aril, covering exterior to the integuments (not in the ovule) (May-apple, Water-lily).

Coma, a tuft of hairs on certain seeds (Silkweed). This is to be distinguished from pappus, which is a tuft on the fruit (Achenium).

(2.) PARTS OF NUCLEUS:

Embryo (*e*), the initial plantlet.

Radicle (*r*), the rudimentary stem or first internode.

Cotylēdon (*c*), the seed leaf at the primary node.

Plūmule (*p*), the growing points above the cotyledons.

Albūmen (*a*), the food for the plantlet's first growth, stored outside the embryo.

Kinds. — (1.) GENERAL FORM: *Orthotropous*, ; *campylótropous*, ; *anátropous*, ; *amphítropous*, same as in ovule.

(2.) FORM OF COVERING:

Conformed, adhering closely to nucleus.

Cellular, loose (Pyrola).

Winged, having expanded appendages (Catalpa).

Woolly, covered closely with fibers (Cotton).

Cōmose, with coma at the end (Willow Herb).

(3.) TEXTURE OF ALBUMEN:

Farinaceous, mealy (Wheat).

Oily, mealy but mixed with oil (Poppy).

Mucilāginous, like mucilage (Morning-glory).

Ruminated, wrinkled (Papaw).

(4.) NUMBER OF COTYLEDONS:

Monacotylédonous, (Corn).

Dicotylédonous, (Bean).

Polycotylédonous, (Pine).

(5.) Position and Arrangement of Embryo:

Eccentric, embryo on one side of albumen (Indian Corn).

Peripheric, curved around albumen (Four-o'clock).

Accumbent, applied to the cotyledons when the radicle is bent and lies along their edge (Water-cress).

Incumbent, applied to the cotyledons when the radicle rests against the back of one of them (Shepherd's Purse).

Conduplicate, applied to cotyledons that are incumbent and so folded as to embrace the radicle (Mustard).

(6.) The Direction of the Embryo as respects the Pericarp.

Ascending, pointing to the apex.

Descending, pointing to the base.

Centripetal, pointing to the axis.

Centrifugal, pointing to the sides.

BOTANICAL CLASSIFICATION OF PLANTS

The living plants may be divided into two grand divisions—Flowering Plants and Flowerless Plants—with five main subdivisions, according to the complexity and structure of their reproductive organs, or seed structure. The scientific names of these groups are the *Thallophyta*, the *Bryophyta*, the *Pteridophyta*, the *Gymnosperms*, and the *Angiosperms*.

Each of the five main groups is divided into a number of lesser subdivisions, sometimes called *phyla*, orders, each of which is composed of several families.

Most systematic botanists begin the study of plants with the lowest forms of plants and proceed to the highest. In the following classification, however, the usual order has been *reversed* because of its greater interest for a large majority of readers; the highest division is placed first and the lowest last.

In the earlier days of the science of botany nearly every botanist's energies were devoted to this branch which we now call *systematic botany*. There are now named and described close on a quarter of a million of living species of plants altogether, including the lower and often nearly invisible forms, and of this vast number about one hundred and thirty thousand belong to the highest group of all—the Angiosperms. With nearly a quarter of a million described forms to deal with the value of such keys will be recognized.

Sub-Kingdom I.—Flowering Plants (*Phanerogams*), or Spermophytæ.

(1) *Angiosperms* (*anj'ĭ-o-sperms*)—Plants producing protected seeds.

The greatest group, the *Angiosperms*, with over a hundred and thirty thousand species, contains nearly all the plants that yield crops of economic importance to man, or that decorate his gardens, or that feed his sheep or cattle. They have netted-veined leaves. When this group is further examined, there are found to be two well marked divisions—Monocotyledons and Dicotoledons. The first has embryos with only one cotyledon or "seed leaf," the second has embryos with two. The Angiosperms include over one hundred and thirty thousand species, divided among sixty-two orders, only the most important families of which can be given here.

Order I.—**Ranunculaceæ:** Herbs or small shrubs; about thirty genera.

Anemone (windflower): Perennial herb. Dry copses. Massachusetts to New Jersey and west to Colorado.

Anemonella (rose anemone): Open woods. Canada to Georgia and west through Mississippi Valley.

Caltha (cowslip, marsh marigold): Perennial herb. United States and Canada.

Clematis (virgin's bower): Perennial. United States and Canada.

Ranunculus (buttercup, crowfoot): Herb, annual or perennial. Canada, United States and Europe.

Thalictrum (meadow rue): Perennial herb. United States and Canada.

Order II.—**Berberidaceæ:** Shrubs or perennial herbs; nineteen genera.

Berberis (barberry): Fruit, a sour berry. Found in Europe; naturalized in New England.

Podophyllum (May apple, mandrake): Perennial herb. Fruit, a berry. Found: Eastern North America; a species in Himalaya Mountains.

Order III.—**Papaveraceæ:** Annual or perennial herbs with milky or colored juice; about twenty-four genera.

Papaver (poppy): Geographical home on southern edge of North Temperate Zone, spreading north and south. Great opium districts are the valley of Ganges, Asiatic Turkey, Persia, Egypt, Asia Minor, China. From India, fourteen million pounds annually. Persia and Turkey, seventy-one million pounds.

Order IV.—**Cruciferæ:** Herbs; about one hundred and seventy-two genera.

Brassica (turnip, mustard, cabbage, cauliflower, rape): United States, Europe, India, Syria and Russia.

Capsella (shepherd's purse): Naturalized in United States; from Europe.

Cochlearia (horseradish): Perennial. Root. Middle and southern edges of North Temperate Zone, from Great Britain to Asia and northeastern America.

Isatis (woad): Biennial. Throughout Europe. Cultivated in Azores and Canary Isles.

Nasturtium (watercress): Europe and northern Asia. Cultivated in Palestine, Hindustan, Japan.

ORDER V.—**Capparidaceæ:** Herbs, shrubs, trees; twenty-three genera.

Capparis (caper): Small shrub. Southern France and Mediterranean countries, Sicily, Malta.

ORDER VI.—**Violaceæ:** Herbs; twenty-one genera.

Viola (violet): Perennial. Canada; United States, west to Colorado; throughout Europe, some parts of China, Japan, India.

ORDER VII.—**Bixinæ:** Shrubs; 29 genera.

Bixa (arnotto): Tropical America. Cultivated in southern Europe, Burma, Philippine Islands, Hindustan.

ORDER VIII.—**Terustrœmiaceæ:** Shrubs and small trees; thirty-two genera.

Thea (tea): Shrub. China. Cultivated between parallels of 25° and 35° throughout Asia. In Kangra, Gurhwal, Assam, Cachar, Sylhet, Chittagong, Darjelling, Chota, Nagpur, Hindustan, Japan, Australia, Jamaica, Brazil, North America.

ORDER IX.—**Malvaceæ:** Herbs, shrubs.

Gossypium (cotton): Tropical and sub-tropical. East Indies, China, Asiatic Islands, Greece, islands in eastern Mediterranean, Asia Minor, northern and western Africa, Australia, West Indies, southern United States, Venezuela, British Guiana, Brazil.

ORDER X.—**Sterculeaceæ:** Trees and shrubs.

Theobroma (cocoa): Tropical and sub-tropical. Brazil and north of Brazil, West Indies, Mexico. Cultivated in Philippine Islands, southern Europe, India.

ORDER XI.—**Tiliaceæ:** Trees and shrubs; 40 genera.

Carchorus (yellow jute): Southern belt of North Temperate Zone and Tropics. Cultivated in southern and western Asia, Grecian Archipelago, central and northern Africa.

ORDER XII.—**Linaceæ:** Shrubs and herbs; 94 genera.

Linum (flax): Herb. Widely distributed. Hindustan, southern Egypt, throughout Europe, southern and middle Russia, northeastern America.

Erythroxylon (coca): Shrub. Tropical and sub-tropical. Bolivia, Peru, Ecuador, Colombia, northern Brazil.

ORDER XIII.—**Zygophyllaceæ:** Trees, shrubs, herbs; seventeen genera.

Guaiacum (lignum-vitæ): Tree. Tropical and sub-tropical. Exclusively American; native to West Indies.

ORDER XIV.—**Rutaceæ:** Small trees and shrubs; eighty-three genera.

Citrus (orange, lemon, shaddock): In all regions of no frost. India. Cultivated in Persia, Syria, southern Europe, northern Africa, Spain, China, Japan, Sicily, Australia, Brazil, West Indies, Florida, southern California, Azores.

ORDER XV.—**Meliaceæ:** Trees; thirty-seven genera.

Swietenia (mahogany): Large tree. Tropical and sub-tropical. West Indies, Bahamas, Central America, southern Florida. Cultivated in southern British India.

ORDER XVI.—**Ilicinæ:** Trees and shrubs; three genera.

Ilex (Paraguay tea): Small tree. Paraguay. In Parana, ten million pounds produced annually.

ORDER XVII.—**Rhamnaceæ:** Trees and shrubs; thirty-seven genera.

Ceanothus (New Jersey tea): Shrub. Eastern North America.

Rhamnus (buckthorn): Shrubs, small trees. Southern Persia and southern Levant countries. Grows as far north as England.

ORDER XVIII.—**Ampelideæ:** Woody vine; few genera.

Vitis (grape): Zone from 21° N. latitude to 48°. British Isles and Portugal, east to Persia. Middle Atlantic States to California. Cultivated in Australia.

ORDER XIX.—**Sapindaceæ:** Trees and shrubs; seventy-three genera.

Acer (maple): Tree. Not south of 38° N. latitude, except in high mountains in northern United States and southern British America.

ORDER XX.—**Anacardeaceæ:** Trees and shrubs; forty-six genera.

Anacardium (cashew nut): Tropics of Asia and America, Jamaica.

Rhus (sumach): North America, Canada to Gulf States; Arkansas, Levant, and western Europe, Syria. Cultivated in Sicily, Italy, Turkey, Spain, Portugal.

ORDER XXI.—**Leguminosæ:** Herbs, shrubs, trees; four hundred genera.

Acacia (gum arabic): Shrubs and small trees. Tropical and sub-tropical, but widely distributed. Australia, Africa, Asia, America.

Arachis (peanut): Sub-tropical. Southern United States, southern and central Virginia, the Carolinas and Tennessee.

Astragalus (gum tragacanth): Small shrub or herb. Sub-tropical. Persia, Greece, east Mediterranean Islands, Syria.

Cassia (senna): Tropical and sub-tropical. Widely distributed.

Cæsalpinia (Brazil wood): Trees. Brazil.

Dalbergia (rosewood): Trees and vines. Brazil and southern Asia.

Glycyrrhiza (licorice): Small shrub and herb. Italy and southern Europe, southern England. Cultivated in Spain and Portugal.

Hæmatoxylon (logwood): Small tree. Yucatan, Guatemala, Honduras, Isthmus of Panama, West Indies. Cultivated in Burma.

Indigofera (indigo): Shrub. India, Java, East Indies, north Africa, West Indies, Central Asia.

Lens (lentil): Annual. Syria, Egypt, southern and central Europe, Hindustan.

Phaseolus (bean): Annual herb. Tropics and Temperate Zones to forty-fifth parallels.

Pisum (pea): Annual herb. Central and southern Europe, Egypt, Syria, Japan, India, China.

Tamarindus (tamarind): Tree. Tropical and sub-tropical. Africa. Cultivated in Arabia, southern India, Ceylon, Java, Philippines, northern Australia, Pacific Isles, South America.

ORDER XXII.—**Rosaceæ:** Trees, shrubs, herbs; seventy-one genera.

Fragaria (strawberry): Herb. Widely distributed, even to Kamchatka and Alaska.

Prunus (plum): Tree. Temperate Zone, south of 60°. Europe, western Asia. Cultivated in northeast America.

Prunus (cherry): Tree. North Africa, Holland, Portugal. Cultivated in southeastern Africa, America, Belgium, England.

Prunus (apricot): Tree. Armenia, Persia, China, Japan, California.

Prunus (peach): Tree. Southern half of North Temperate Zone in Asia, Europe, America, New Jersey, Pennsylvania, Delaware, Maryland.

Pyrus (apple): Tree. England, France, Germany, Netherlands, Prussia, Poland, United States, south Australia.

Pyrus (pear): Tree. China, Syria, Persia, central and northern Europe, Belgium, France, Great Britain. Cultivated in North America.

Pyrus (quince): Tree. Northern Persia, east and west. Cultivated in northeastern America, Portugal.

Rubus (black respberry and raspberry): Shrub. Temperate Zone, between 30° and 50° latitude. In North America, Europe north to sixtieth parallel, south to northern parts of Africa, Asia Minor, and eastward into India; also in British Isles.

ORDER XXIII.—**Saxifragaceæ:** Shrubs, herbs; seventy-three genera.

Ribes (currant): Shrub. Lapland and southern Europe; also in the New World, northern United States to south and middle Canada.

Ribes (gooseberry): Shrub. France, England, Germany and northeastern Russia, Siberia.

ORDER XXIV.—**Combretaceæ:** Shrubs, trees; seven genera.

Terminalia (myrobalano): Large trees. Tropical India, along southern fringes of Ghaut Mountains, and in Burma.

ORDER XXV.—**Myrtaceæ:** Trees; seventy-six genera.

Bertholletia (Brazil nut): Large tree. Tropical South America, Panama.

Eugenia (cloves): Molucca Islands. Cultivated in Brazil, West Indies.

Eugenia (allspice): Jamaica.

Myrtus (myrtle): Tropical and sub-tropical. Southeastern Italy. Cultivated in all Mediterranean countries.

ORDER XXVI.—**Lythraceæ:** Tropical trees; thirty genera.

Punica (pomegranate): Persia. Cultivated in Syria, Asia Minor, Levant, southern Europe, China, Japan, South and North America.

ORDER XXVII.—**Cucurbitaceæ:** Herbs; sixty-eight genera.

Citrullus (watermelon): Herbaceous vine. Africa. Cultivated in southern Europe and southern and middle North America.

Cucumis (cucumber): Northeastern India. Cultivated in Levant, southern Asia, southern Europe, Africa, southern Russia, United States.

Cucumis (muskmelon): British India, Baluchistan, West Africa, Guinea, banks of Niger. Cultivated in Mediterranean States, India, China, Japan, middle and southern United States.

Cucurbita (squash): Annual. Europe and western Asia. Cultivated in Pacific Islands, southern Asia, Africa.

Cucurbita (pumpkin): Warm climates.

ORDER XXVIII.—**Umbelliferæ:** Herbs; one hundred and fifty-two genera.

Apium (celery): Biennial. Great Britain, western Europe, Mediterranean shores, Peloponnesus, Caucasus, Palestine, South America, and western coast of North America to southern California.

Coriandrum (coriander): Annual. Tartary. Cultivated in Hindustan, Burma, middle, southern and western Europe, North America.

Carum (parsley): Biennial. Mediterranean countries and Asia Minor. Cultivated in Japan, England, and northeastern America.

Carum (caraway seed): Lapland to Siberia. Cultivated in Great Britain and Continent south of 60°, North Africa, Hindustan, Burma, northeastern America.

Cuminum (cumin): Northern Africa, middle and southern Europe, Syria, Hindustan, Bombay, Burma.

Daucus (carrot): Biennial. Herb. All over Europe south of 60°, especially in France, Germany, northern Africa, southwestern Asia, China, Japan. Cultivated in North America.

Fœniculum (fennel): Biennial. Levant. Cultivated in Hindustan, Atlantic States, France, Germany, Great Britain, southern Europe.

Pinipinella (anise): Perennial. Egypt, Syria, Malta, Spain, southern Germany, Hindustan, Japan.

Pencedanum (parsnip): Biennial. Europe, southern Greece. Cultivated in Asia and North America.

Ferula (asafetida): Middle and western Asia.

ORDER XXIX.—**Rubiaceæ:** Trees, shrubs, herbs; three hundred and thirty-seven genera, including madder, coffee, tea, etc., according to most authorities.

Cephaelis (ipecacuanha): Shrub. Tropical and sub-tropical. Bolivia, Colombia. Cultivated in West Indies, Hindustan, India, America.

Cinchona (Peruvian bark): Trees. Tropical Andes. Cultivated in Ceylon, Jamaica.

Coffea (coffee): Shrub. Persia. Cultivated in Arabia, East Indies, Mexico, Brazil, Guatemala, Cuba, British West Indies, Santo Domingo, Java, Padang, Sumatra, Macassar, Ceylon, British India, Manila.

Rubia (madder): Perennial. West Asia, Mediterranean countries.

ORDER XXXVII.—**Borraginaceæ:** Herbs; sixty-eight genera.

Symphytum (comfrey): Perennial herb. Peloponnesus and Greek islands. Cultivated in middle Europe and older parts of the United States.

ORDER XXXVIII.—**Convolvulaceæ:** Herb; thirty-two genera.

Ipomoea (sweet potato): Perennial. Asia and America. Cultivated in southern United States, Carolinas, Virginia, Maryland, Delaware, southern New Jersey, southern Spain, Italy.

ORDER XXXIX.—**Solanaceæ:** Herb; sixty-six genera.

Atropa (deadly nightshade): Europe, western Asia. Cultivated in North America.

Capsicum (red pepper, cayenne pepper): Annual. South America, southern Asia. Cultivated in southern Europe and in United States, West Indies, middle Africa, southern Asia.

Lycopersicum (tomato): Annual. South and Central America. Cultivated in Italy, southern France, Spain, Greece, northern Africa, Islands of southern Asia, England (under glass), Virginia, Carolinas.

Nicotiana (tobacco): Santo Domingo, South Atlantic States of United States of America. Cultivated in Virginia, Kentucky, Carolinas, Venezuela, Cuba, Brazil, Connecticut, Pennsylvania, Holland, Flanders, France, Alsace, Hungary, European Turkey, China, Japan, southern Africa, Australia.

Solanum (potato): Chile. Cultivated wherever cereals flourish.

ORDER XL.—**Pedalineæ:** Herb; ten genera.

Sesamum (sesame): Sunda Islands. Cultivated in India, western Asia, southern Europe, northern Africa, America.

ORDER XLI.—**Verbenaceæ:** Tree; fifty genera.

Tectona (teak): Tropical. East Indies, Burma, Philippines.

ORDER XLII.—**Labiateæ:** Herb; one hundred and thirty-six genera.

Lavandula (lavender): Greece and Grecian Isles. Cultivated in Hindustan, Atlantic States of North America, Levant.

Marrubium (hoarhound): Perennial. Levant, Peloponnesus, etc. Cultivated all over Europe, and in Temperate Zone in Asia, and Atlantic States in North America.

Mentha (pennyroyal): England, Hindustan, Japan, Persia, India, Egypt. In a belt from eastern side of Mississippi Valley to Japan.

Mentha (spearmint): England, etc., as above.

Nepita (catnip): Perennial or annual. Europe, western Asia, Levant, North America.

Origanum (marjoram): Levant, Mediterranean countries, Europe, as far north as fiftieth parallel. Sweet marjoram, native in Greece.

Rosmarius (rosemary): Evergreen. Southern Europe, Greek islands in the Peloponnesus. Cultivated in western Europe, Japan, Egypt, Hindustan, Asia.

Salvia (sage): Mediterranean countries. Cultivated in middle-southern Europe, British Isles, North America, British India.

Thymus (sweet thyme): Perennial. Spain, southern Europe, Mediterranean States, mountains of Greece, and islands of Archipelago, British Isles, southern Siberia.

ORDER XLIII.—**Chenopodiaceæ:** Herb; eighty genera.

Beta (beet): Europe and western Asia. Cultivated in Europe, west Africa, temperate British India, North America.

Spinacia (spinach): Annual. Persia. Cultivated in middle of North Temperate Zone, from Hindustan to western shores and islands of Europe, eastern United States of North America, South Pacific Islands.

ORDER XLIV.—**Polyonaceæ:** Herb; thirty genera.

Fagopyrum (buckwheat): Central Asia and Tartary, Russia. Cultivated in Canada, northern United States, northern and central Europe.

Rheum (rhubarb): Perennial. Tartary. Cultivated as far north as fiftieth parallel, China, especially in provinces of Shensi, Kansu, and Szechuen.

ORDER XLV.—**Piperaceæ:** Shrub; eight genera.

Piper (pepper): Southern Asia. Cutivated in southern India, Java, Sumatra, and Malabar.

ORDER XLVI.—**Myristicaceæ:** Trees, shrubs; one genus.

Myristica (nutmeg): Molucca Islands. Cultivated in Sumatra, Island of Bourbon, Mauritius, Madagascar, West Indies.

ORDER XLVII.—**Lauraceæ:** Tree; thirty-four genera.

Cinnamomum (cinnamon): East India Archipelago. Cultivated in Ceylon, West Indies, South America, Pacific Isles.

Cinnamomum (camphor): Trees. Japan, Formosa, China, Borneo. The camphor gum of commerce was introduced into Europe by the Arabs.

ORDER XLVIII.—**Santalaceæ:** Herbs, shrubs, trees; twenty-eight genera.

Santalum (sandalwood): Trees. East Indies, Asia, Malaysia, Pacific Islands, India, China.

ORDER XLIX.—**Euphorbiaceæ:** Herbs, shrubs, trees; one hundred and ninety-five genera.

Buxus (box): Evergreen, shrub, and small trees. Southern Europe, western Asia, Syria, Persia, and south of Black Sea. Cultivated in middle States of North America and Virginia.

Croton (croton-oil plant): Cultivated in southeastern Hindustan and East India Islands.

Hevea (caoutchouc): Large tree. South America. Cultivated in southern Asia, middle Africa, northern Australia.

Manihot (tapioca): Tropical and sub-tropical South America. Cultivated in southern Asia and western Africa.

Ricinus (castor-oil plant): Annual. Southern Asia, eastern Africa. Cultivated in Japan, Bengal, eastern and northern Africa, southern Europe and United States, especially Kansas.

ORDER L.—**Urticaceæ:** Trees, shrubs, herbs; one hundred and eight genera.

Cannabis (hemp): Annual. Chinese Tartary, northern India, southwestern Siberia. Cultivated in China, Japan, Persia, Hindustan, Egypt, southern Africa, Russia, European states, Canada, United States.

Ficus (fig): Tree. Subtropical. Western Asia. Cultivated through Mediterranean countries west to Canary Isles.

Humulus (hop): Perennial herb. Middle Europe, Siberia, Levant, Asia Minor, Japan, North America, foot-hills of Rocky Mountains, and along upper Arkansas River, Missouri and Mississippi Rivers, Lake Winnipeg, North Atlantic States. Cultivated in Egypt.

Morus (mulberry): Tree. Cultivated in western New England, southern upper Canada, Dakotas, Kansas and the South. White mulberry is a native of China and Japan. Cultivated in Italy, Greece, Asia Minor, Armenia.

Ulmus (elm): Tree. From Mediterranean countries to the middle of European Russia, from southern banks of St. Lawrence River to Gulf of Mexico, and westerly to foot-hills of Rocky Mountains.

ORDER LI.—**Juglandaceæ:** Trees; five genera.

Juglaus (butternut): Northeastern North Africa. Cultivated in middle Europe and England.

Juglaus (walnut): Southwestern New York and southward to Gulf of Mexico and westward beyond Mississippi River. Cultivated in eastern middle States and southern New England, England and southern Europe.

Hicoria (hickory nut): North and middle States of North America from Atlantic to Mississippi River, and cultivated in corresponding latitude in Europe.

Hicoria (pecan nut): Southern North America. Cultivated in Prussia and England.

ORDER LII.—**Cupuliferæ:** Trees; ten genera.

Castanea (chestnut): Eastern coast of North America, west to eastern Kentucky and Tennessee. Cultivated in middle and southern England, middle and southern Europe, northern Africa, Levant, and southern and eastern Asia.

Corylus (hazelnut): Levant. Cultivated between 35° and 55° latitude in Northern Hemisphere, eastern parts of Western Hemisphere, and western Old World.

Fagus (beech): Temperate Zones up to 60° north latitude, south to 50°.

Quercus (oak): Temperate Zones above 35°, and in a zone between 30° and 60° around the globe.

ORDER LIII.—**Salicaceæ:** Shrubs, trees; numerous genera.

Salix (weeping willow): Western and southern Asia. Cultivated in southern England.

Salix (curled willow): England. Cultivated in eastern United States.

ANGIOSPERMS (LEAVES PARALLEL-VEINED)

ORDER LIV.—**Orchidaceæ:** Woody vine; three hundred and thirty-four genera.

Vanilla (climbs over lofty trees): Tropical and sub-tropical southern Mexico, coast of Vera Cruz. Cultivated in Guatemala, Mauritius, Bourbon, Madagascar, Java.

ORDER LV.—**Zingiberaceæ:** Herbs; thirty-six genera.

Curcuma (turmeric): Farther India and Asiatic isles, southern Asia and Malay Peninsula. Cultivated in Hindustan, Cochin-China, southern India, Bengal, Java, Pacific Isles.

Elettaria (cardamom): Perennial. Tropical Asia. Cultivated in southern India, Madras, Allepy, Ceylon.

Maranta (arrowroot): Tropical America, Florida.

Musa (banana): Asia. Cultivated in Indian Archipelago, China, Cochin-China, Hindustan, Australia, Pacific Islands, Madagascar, western Africa, Sicily, southern Spain, Mexico, Central America, Colombia, Peru, northern Brazil, Guiana, West Indies, southern Florida, and Louisiana.

Musa (manila): Philippines. Cultivated in India and southern Asia.

Zingiber (ginger): Sub-tropical. Southern Asia. Cultivated on western coast of Africa, in the West Indies, and southern slopes of Himalayas.

ORDER LVI.—**Bromeliaceæ:** Herbs; twenty-seven genera.

Ananassa (pineapple): Perennial root. Tropical. Bahama Islands. Cultivated in South America, Florida, southern shores of Europe, East Africa, Pacific Isles, India.

ORDER LVII.—**Iridaceæ:** Herbs; fifty-seven genera.

Crocus (saffron): Throughout southern parts of North Temperate Zone.

ORDER LVIII.—**Dioscoreaceæ:** Shrubs; eight genera.

Dioscorea (yam): Tropical and sub-tropical Africa.

Dioscorea (Chinese yam): America, Asia, Malaysia. Cultivated in Japan, East Indies, Siam.

ORDER LIX.—**Liliaceæ:** Herbs; one hundred and eighty-seven genera.

Asparagus: Perennial herb. Japan, Levant. Cultivated in England, Holland, central Europe, Mediterranean countries, sandy places of Poland, southern Russia, Hindustan, North America.

Aloe: Southern Asia, Arabia, southern Africa. Cultivated in southern Europe, northern Africa, British West Indies.

ORDER LX.—**Palmæ:** Shrubs and small and large trees; one hundred and thirty-seven genera.

Areca (betelnut): Sunda Isles, Philippines, Cochin-China, Sumatra, southern India.

Cocos (cocoanut): East India Archipelago, Arabia, Persia, Malay. Cultivated in eastern Africa, western America, Brazil, West Indies, islands of Central America.

Metroxylon (sago palm): Malacca, southern China. Cultivated in Eastern Archipelago.

Phœnix (date palm): Between 15° and 30° north latitude, from Atlantic Coast to the River Indus; Sahara oases. Cultivated in Acre, Palmyra, Jaffa.

ORDER LXI.—**Gramineæ:** Herbs; one thousand two hundred and ninety-eight genera.

Avena (oats): West central Asia, east central Europe. Cultivated in Scotland, Ireland, Norway, Canada, United States.

Hordeum (barley): Annual. Temperate western Asia. Cultivated in northern Russia, Siberia, etc.

Oryza (rice): Southern Asia. Cultivated in India, China, Japan, East Indies, Africa, southern Europe, Hungary, South America, southern United States.

Setaria (millet): China, Japan, India. Cultivated wherever oats and rye are, except in United States.

Saccharum (sugar-cane): Perennial. Cochin-China. Cultivated in West Indies, Brazil, Mexico, Louisiana, Mississippi, Missouri, Mauritius, southern India, Pacific Islands, northern Australia.

Sorghum (broom corn): Annual. Middle Africa. Cultivated in southern India, northern Africa, southern and middle Europe, throughout United States.

Secale (rye): Southern Russia and north of Black and Caspian Seas. Cultivated in northern Germany, Poland, Sweden, Norway, Russia, western Europe, United States.

Triticum (wheat): Cultivated in western Asia, western America, southern Russia, central and western Europe, southern Italy, Turkey, Syria, northern and southern Africa, Brazil, Chile, Australia. Great wheat-growing regions are southwestern plains of Russia and central plain of North America, and in southern California, northern India, England.

Zea (Indian corn or maize): America. Cultivated in United States, upper Canada, South America, Mexico, southern Europe, Africa, western Asia.

ORDER LXII.—**Coniferæ:** Shrubs, trees; thirty-two genera.

Abies (fir): Northeastern North America, Quebec, New Brunswick, Nova Scotia, middle States, western Wisconsin. Cultivated in England.

Chamæcyparis (cypress): Evergreen, cypress. Cultivated between 30° and 42° N. latitude in both hemispheres, Carolinas, Georgia, Florida.

Lumpirus (cedar): Trees and shrubs. Middle and western Europe, northern Asia, North America.

Larix (larch): Mountains of middle Europe, north of New York to Pacific Ocean.

(2) *Gymnosperms* (*jĭm'nŏ-sperms*).—Plants producing naked seeds (*i. e.*, seeds not inclosed in an ovary), as the common pine and hemlock.

This second division of flowering plants (*phanerogams*) includes four living groups: (*a*) Coniferæ, including all evergreen trees, such as pine, fir, redwood (*Sequoia*), etc.; (*b*) Cycadaceæ, trees such as cypress, palmetto, etc.; (*c*) Gnetaceæ; (*d*) Ginkgo. There are about five hundred living species.

ORDER LX.—

ORDER LXX.—

SUB-KINGDOM II.—Flowerless Plants, or Cryptogamia (*krĭp'tŏ-gā'mĭ-à*).

(3) *Pteridophyta* (*tĕr-ĭ-dŏf'ĭ-ta*).

This group does not include over five thousand species altogether. All its members have a well-marked differentiation into leaves and stems, some with large leaves like the Bracken fern and some with small leaves like the Club-moss. All are provided with well-differentiated wood and phlœm, which are arranged in bundles in the stem. All the members, also, have a well-marked alternation of generations, but it differs from that of the bryophytes, for the leafy plant which is conspicuous is the spore-producing generation, while the sexual generation is a very small and inconspicuous little structure, as simple as an alga except for its sexual organs. To this cohort belong all the ferns, all the Equisetums, or Horsetails, and the Club-mosses and Selaginellas.

(4) *Bryophyta* (*brĭ-ŏfĭ'-tà*).

The *Bryophyta* form a much smaller group, reported to have about sixteen thousand species. Some of these appear, as do the mosses, to have true leaves, but their apparent leaves are not really like those of the higher plants. They have no true wood or vessels. They have a definite alternation of generations, but the spore-producing generation grows on to the "leafy" sexual generation, and is generally, but wrongly, called its "fruit capsule." To this group belong the Mosses and Liverworts.

(5) *Thallophytes* (*thăl'ō-fitz*).

The *Thallophytes* have the largest number of species after the Angiosperms, and number about eighty thousand species all told. They are all comparatively simple in structure and have no differentiation into stems and roots. The Thallophytes include the algæ, the large fungi, the toadstools, and all the parasitic and disease producing forms of plants.

ALGÆ are divided into FLORIDEÆ, the Red Seaweeds, and the orders *Dictyoteæ*, *Oösporeæ*, *Zoösporeæ*, *Conjugatæ* *Diatomaceæ*, and *Cryptophyceæ*.

FUNGI include the molds, mildews, mushrooms, puffballs, etc., which are variously grouped into several sub-classes and many orders. The *Lichenes* or Lichens are now considered to be of a mixed nature, each plant partly a Fungus and partly an Alga.

THREE CELEBRATED PICTURES OF ANIMAL FAVORITES

ORPHEUS AND HIS LUTE. From the painting by J. C. Dollman

THE POLAR BEAR BEGS

LION-MARMOSETS OF BRAZIL

BOOK OF THE ANIMAL KINGDOM

SCIENTIFIC CLASSIFICATION OF ANIMALS

TABULAR VIEW OF REPRESENTATIVE ANIMAL TYPES

ANIMALS IN CLASSIFIED GROUPS:

I. Wild Animals:

(1) THE MAMMALS: (*a*) The Monkey Tribe; (*b*) Animals of Prey; (*c*) Gnawing Animals; (*d*) Hoofed Animals; (*e*) Toothless Animals; (*f*) Thick-Skinned Animals; (*g*) Pouched Animals; (*h*) Flying Animals; (*i*) The Seals; (*j*) The Whales.

(2) THE BIRDS: (*a*) Birds of Prey; (*b*) Climbing Birds; (*c*) Singing Birds; (*d*) Wading Birds; (*e*) Swimming Birds; (*f*) Running Birds; (*g*) Game Birds.

(3) THE REPTILES: Lizards; Chameleons; Snakes; Crocodiles; Tortoises; Turtles.

(4) AMPHIBIANS: Frogs; Toads; Salamanders.

(5) THE FISHES: (*a*) Bony Fishes; (*b*) Cartilaginous Fishes; (*c*) Armored Fishes; (*d*) Lungfishes.

(6) THE MOLLUSCS: Snails; Cuttlefish; Squids; Octopus; Tusk Shells; Bivalves; Oysters.

(7) JOINTED-LIMBED ANIMALS: Crabs; Lobsters; Scorpions; Spiders; Insects; Grasshoppers.

(8) BUTTERFLIES AND MOTHS: Straight-Winged Insects; Ants and Bees; Flies.

(9) STARFISHES AND SEA-URCHINS.

(10) SIMPLEST FORMS OF LIFE.

Domesticated Animals:

(1) DOMESTICATED MAMMALS: Alpaca; Ass; Camel; Cat; Cattle; Dog; Elephant; Gayal; Goat; Guinea Pig; Horse; Llama; Rabbit; Reindeer; Sheep; Swine; Yak; Zebu.

(2) DOMESTICATED BIRDS: Canary; Chickens or Fowls; Guinea; Goose; Ostrich; Parrot; Peacock; Pigeon; Swan; Turkey.

(3) DOMESTICATED INSECTS: Bee; Cochineal; Silkworm Moth.

PRONOUNCING DICTIONARY OF SCIENTIFIC TERMS CONCERNING ANIMALS

WORLD MAP SHOWING DISTRIBUTION OF ANIMAL LIFE

MAP OF THE WORLD SHOWING THE DISTRIBUTION OF ANIMAL LIFE

THE ANIMAL KINGDOM

SCIENTIFIC CLASSIFICATION OF ANIMALS. MAMMALS: The Monkey Tribe; Animals of Prey; Hoofed Animals; Gnawing Animals; Thick-skinned Animals; Toothless Animals; Pouched Animals; Flying Mammals; The Seal Family; Whales. BIRDS: Song Birds; Birds of Prey; Game Birds; Running Birds; Wading Birds; Swimming Birds. CROCODILES AND OTHER REPTILES. FROGS AND OTHER AMPHIBIA. FISHES. LOBSTERS AND CRABS. INSECTS: Beetles, Butterflies and Moths; Ants; Bees and Wasps; Spiders; Grasshoppers and Locusts; Flies and Mosquitoes. SIMPLE MARINE ANIMALS: Starfish; Jellyfish; Corals; Sponges; Protozoa. DOMESTICATED ANIMALS: Domesticated Mammals; Domesticated Birds; Domesticated Fish and Insects. DICTIONARY OF SCIENTIFIC TERMS.

OF ALL the sciences, Zoology is the most extensive. It is estimated that over two million species of living creatures exist in the world. Between the elephant and the whale, the giants of animal creation, and the mite that is just discernible with the human eye, there are myriads of creatures differing in size, form and habit.

WHY AND HOW ANIMALS ARE CLASSIFIED

It is highly desirable, therefore, to have before us a bird's-eye view of the Animal Kingdom even if it is only occasionally brought into actual use by the average reader. Classification, it should be understood, is only a process of comparison for the purpose of enabling us to determine the exact place of each animal in the plan of Nature. In other words it is simply a scientific method of naming the various animals from the relation of their resemblances.

We are chiefly indebted to the great Swedish scientist Linnæus for the scientific method of naming animals. For his purpose, Linnæus used the Latin as the universal language of science. For example, he named the dog in his classification *Canis familiaris*, using a generic word and a specific word—just as they are used in the name of George Washington. In scientific classification, however, these names have become abstract terms, and they represent certain grades or degrees of resemblance which are spoken of as species, genera, families, orders, classes, and so on.

SCIENTIFIC CLASSIFICATION OF THE DOG

In this way we determine the exact place of each animal. The dog belongs to the kingdom *Animalia*, sub-kingdom *Metazoa*, class *Mammalia*, order *Carnivora*, family *Canidæ*, genus *Canis*, species *Familiaris*, variety *Hound* (possibly) and its individual name, perhaps, is "Rover."

The important thing is that the reader should have a picture of the actual animal representing each class in his mind's eye. He should master the distinctions between the *great groups*, or classes, before proceeding to a more minute classification.

TABULAR VIEW OF REPRESENTATIVE ANIMAL TYPES

The present day classification of animal life falls into two great divisions: (1) *Protozoa*, representing those composed of a single cell; and (2) *Metazoa*, those whose bodies are composed of many cells. The Protozoa, so far as known, form a single division or branch of the animal kingdom, and the Metazoa comprise various higher branches. In the following table the divisions are given from the highest forms to the lowest, rather than in the reverse order frequently given, and sets out the chief characteristic and animal examples of each division.

ANIMAL KINGDOM (*Kingdom Animalia*)

SUB-KINGDOM METAZOA (Gr. *meta*, after; *zóon*, animal).—Animals with cellular tissues, true eggs, and blastoderm. The group comprises all animals except the Protozoa.

CLASS I. **Mammalia** (Lat., *mamma*, breast).—Animals which suckle their young, bringing them into the world alive. *Examples:* man, monkey, ox, elephant and whale.

ORDER I. **Primates** (Lat., *primus*, first).

Sub-Order I.

Bimana (Lat., *bis*, twice; *manus*, a hand).—Two-handed animals. *Example*: man.

Sub-Order II.

Quadrumana (Lat., *quatuor*, four; *manus*, a hand).—Four-handed animals. *Example:* the monkey.

ORDER II. **Chiroptera** (Gr., *cheir*, a hand; *pteron*, a wing).—Hand-winged animals. *Example:* the bat.

ORDER III. **Insectivora** (Lat., *insecta*, insects; *voro*, "I devour").—Insect-eaters. *Examples:* the hedgehog and mole.

ORDER IV. **Carnivora** (Lat., *caro, carnis*, flesh).—Flesh-eaters. *Examples*: lion, tiger, fox and weasel.

ORDER V. **Rodentia** (Lat. *rodere*, to gnaw).—Gnawing animals. *Examples:* rat, rabbit and beaver.

ORDER VI. **Ungulata** (Lat., *ungula*, nail, claw or hoof).—Hoofed animals.

Sub-Order I.

Hyracoidea (Gr., *hyrax*, shrew-mouse).—*Example:* Syrian hyrax.

Sub-Order II.

Proboscidea (Lat., from the Gr., *proboskis*, an elephant's trunk; literally a front-feeder), proboscis-bearers. *Example:* elephant.

Sub-Order III.

Perissodactyla (Gr., *perisos*, superfluous; *daktulos*, finger or toe), odd-toed animals. *Examples:* tapir, rhinoceros, horse, ass, and zebra.

Sub-Order IV.

Artiodactyla (Gr., *artios*, equal; *daktulos*, finger or toe), equal-toed animals.

GROUP I. **Pecora** (Lat., plural of *pecus*, cattle) or Ruminantia (Lat., *rumen*, a paunch).—Ruminating or cud-chewing animals. *Examples:* ox, sheep, goat, antelope, deer and giraffe.

GROUP II. **Tragulina** (Gr., *tragos*, goat), or Deerlets. *Example:* kanchil.

GROUP III. **Tylopada** (Gr., *tylos*, a knob or swelling, and *pous, podos*, a foot). — Ruminants with digits encased in cutaneous pads. *Example:* camel.

GROUP IV. **Suina** (Lat., *sus*, a pig).—Swine-like animals. *Examples:* swine, peccary and hippopotamus.

ORDER VII. **Sirenia** (Lat., *siren*, a sea nymph).—Sea-cows. *Examples:* manatee and dugong.

ORDER VIII. **Cetacea** (Gr., *ketos*, a whale), animals of the whale kind. *Examples:* whale and dolphin.

ORDER IX. **Edentata** (Lat., *edentatus*, toothless).—Toothless animals. *Examples:* sloth, ant-eater and armadillo.

ORDER X. **Marsupialia** (Lat., *marsupium*, a pouch).—Pouched animals. *Examples*: kangaroo and opossum.

ORDER XI. **Monotremata** (Gr., *monos*, single; *trema*, orifice).—Egg-laying mammals. *Examples:* duckbill or water mole.

CLASS II. **Aves** (Lat., *avis*, a bird).—Birds, animals produced from eggs by the application of heat, usually supplied by the body of the mother bird in close contact with them. They are always clothed with feathers, which are a part of their special construction for flight. *Examples:* eagle, swan, ostrich and lark.

ORDER I. **Birds of Prey** (*Raptores*).—Sharp, curved beak and talons; strong legs; three toes front, one behind. *Examples:* vultures, falcons, secretary birds, owls.

ORDER II. **Perching Birds** (*Insessores*).—Short, slender, legs; three toes front, one behind. *Examples:* swallows, trogons, kingfishers, humming-birds, warblers, thrushes, crows, starlings, finches, hornbills, birds of paradise.

ORDER III. **Climbing Birds** (*Scansores*).— Toes paired; beak usually hooked. *Examples:* toucans, parrots, woodpeckers, cuckoos.

ORDER IV. **Doves and Pigeons** (*Columbæ*).— Legs weak; wings long and pointed. *Examples:* doves, pigeons.

ORDER V. **Game Birds** (*Gallinæ*).— Legs stout, short; beak stout, arched. *Examples:* pheasants, grouse, partridge, turkey, peacock, guinea, prairie chicken, domestic chickens.

ORDER VI. **Ostrich Family** (*Cursores*).—No keel or breast bone; rudimentary wings; stout legs. *Examples:* ostrich, cassowary, bustard.

ORDER VII. **Wading Birds** (*Grallatores*).—Legs and neck long; knee free from body. *Examples:* cranes, herons, snipes, plovers, storks, flamingo.

ORDER VIII. **Swimming Birds** (*Natatores*).—Web-footed. *Examples:* swans, ducks, geese, pelicans, petrels, auks, penguins, gulls, cormorants.

CLASS III. **Reptilia** (Lat., *repo*. "I creep").—Reptiles, cold-blooded animals, protected by scales and not infrequently by hard, bony plates. They are mostly oviparous, but developed from the eggs more or less casually by the heat of the sun. "Reptile" is not an apt name, for there are many members of the class that do not creep. *Examples:* crocodile, lizard, tortoise and snake.

ORDER I. **Serpents** (*Orphidia*).—Body long, cylindrical, scaly, usually limbless; numerous vertabræ and ribs; no eyelids. Lower jaw loosely united in front. *Examples:* rattlesnakes, vipers, boas, pythons, cobras, copperheads, water snakes.

ORDER II. **Lizards** (*Lacertilia*).—Body with long tail; usually four limbs; scaly; bones of the jaw firm. *Examples:* striped and green lizards, horned toads, chameleons, iguana.

ORDER III. **Tortoises and Turtles** (*Chelonia*).—Horny and bony shell within which the head and limbs can be drawn; no teeth; eyelids; four legs. *Examples:* turtles, tortoise, gophers, terrapins.

ORDER IV. **Crocodiles and Alligators** (*Crocodilia*).—Covered with scales and bony plates, teeth in sockets; heart with four cavities; eyelids and earlids. *Examples:* Crocodile and alligator.

CLASS IV. **Batrachia** (Gr., *batrachos*, a frog), or Amphibia (Gr., *amphibios*, having a double life).—Animals that can exist for a considerable time on dry land or in water. They are oviparous, hatched by the heat of the sun from eggs, covered with a soft, glutinous membrane, which the mother had laid in the water, and develop through tadpole stages. In the early period of their existence they are fishlike in their structure, breathing by means of gills and a two-chambered heart; in the later stages of their development they acquire lungs and a heart of three chambers. A true amphibian possesses at once both lungs and gills. *Examples*: frog, toad, newt and salamander.

CLASS V. **Pisces** (Lat., *piscis*, a fish).—Fishes, oviparous animals covered with scales, which form an important part of their special organization for life in the water. Their gills, acting as lungs, extract air from the water instead of from the atmosphere.

ORDER I. **Sharks and Rays** (*Elasmobranchii*).—Shagreen skin; gills fixed and uncovered; cartilaginous skeleton.

ORDER II. **Ganoids** (*Ganoidei*).—Enameled plates or scales; gills free; skeleton partly cartilaginous. *Examples:* garpikes, mud-fish, lung-fish.

ORDER III. **Bony or Fin Fishes** (*Teleostei*).—Skeleton bony; scales; fins; usually four pairs of gills; mostly oviparous. *Examples:* bass, perch and ten thousand other kinds.

CLASS VI. **Arthropoda** (Gr., *arthron*, joint; *pous*, foot).—Metazoa, with definite number of segments; jointed legs; distinct feet and hard, external skeleton.

ORDER I. **Crustacea** (Lat., *crusta*, a crust or shell).—Water-breathing; having gills and more than eight jointed legs; four antennæ. *Examples:* fairy-shrimp, water-fleas, goose barnacle, acorn barnacle, opossum-shrimp, prawn, lobster, crayfish, cancer-crab, rock-crab, pill-bug, sand-hopper.

ORDER II. **Arachnida** (Gr., *arachne*, spider).—Eight legs; air-breathing. *Examples:* garden-spider, tarantula, bird-spider, trap-door spider, mite, tick, king-crab or horseshoe crab.

ORDER III. **Insecta** (Lat., *insectum*, cut in, owing to the grooves surrounding the body).—Distinct head, thorax and abdomen; air-breathing. *Examples:* fishmoth, springtail, cockroach, grasshopper, cricket, katydid, locust, dragon-fly, caddis-fly, may-fly, white ants or termites, ant-lion, water-boatman, water-bug, back-swimmer, chinch-bug, squash-bug, lice, plant-lice, scale-insect, gnat, mosquito, flea, house-fly, stage-beetle, wood-beetle, water-beetle, potato-beetle, ladybug, firefly, moth, butterfly, ants, honey-bees and bumblebees, wasps, hornets, yellow-jackets, centipeds.

CLASS VII. **Mollusca** (Lat., *mollis. soft*),—Soft-bodied, unjointed Metazoa, with muscular skin ("mantle"), generally protected by a calcareous shell; two or three-chambered heart; three main pairs of nerve-ganglia. *Examples:* Clams, oysters, snails, cuttlefish, devil-fish, nautilus.

CLASS VIII. **Echinodermata** (Gr., *echinos*, a hedgehog; *derma*, skin).—Radiated Metazoa, with distinct alimentary canal and well developed nervous system; body-walls secreting calcareous plates; parts in multiple of five. *Examples:* starfish, sea urchins, sea cucumbers, sea lilies, serpent or brittle stars, basket stars.

CLASS IX. **Worms** (*Lat., vermes*).—Bilateral Metazoa, with no jointed legs, nor primitive stripe. *Examples:* earth worm, leech, tube worm, tape worm, bristle worms, vinegar eel, rotifers.

CLASS X. **Cœlenterata** (animals with combined body and stomach cavity).—Radiated Metazoa, with distinct digestive cavity, tentacles and nettling thread-cells. *Examples:* jellyfish, sea-anemones, coral polyps.

CLASS XI. **Porifera** (*Lat., porus*, pore; *fero*, to carry).—Sponges, Metazoa, with numerous. ingoing openings, one or few outgoing orifices, a skeleton, independent cells. *Example:* sponges.

SUB-KINGDOM PROTOZOA (Gr., *protos*, first; *zoon*, animal).—One-celled animals of microscopic size. Simplest forms of animal life. *Examples:* amœba, bell animalcule (*vorticella*), euglena.

ANIMALS IN CLASSIFIED GROUPS

THE MAMMALS (*Mammalia*)

Mammals constitute the highest class of animal creation, and include Man. They have a hard, bony skeleton and a vertebral column or backbone; warm red blood flows in their veins; they breathe by means of lungs, and suckle their young, which they bring forth alive. Their bodies are generally covered with hair. More than three thousand species of mammals are known.

THE MONKEY TRIBE (*Quadrumana*)

Monkeys are animals whose four feet are hand-like, and hence their scientific name, Quadrumana, which means four-handed. They are distinguished from the other animals by their docility, and, more especially, by their power of imitation. It is evident at the first glance that they are nearer related to man than any other animal.

The monkeys have long, loosely hanging arms, with elongated, claw-like fingers; their feet resemble hands. They swing themselves with ease from branch to branch and from tree to tree; they are good climbers, and bring down fruit from the topmost branches. But notwithstanding the aptitude of their hands for climbing, the latter cannot equal the dexterity of the human hand, which is justly described as the tool of all tools.

Monkeys differ outwardly from man in many respects: their foreheads are low, and almost disappear under the overhanging hair; their ears are directed upwards; their nose is exceedingly flat and scarcely projects; their teeth resemble those of the animals of prey; their chin is receding; their entire skin is hairy, except in a few places; and their movements are, in most instances, only possible with the assistance of their long arms.

The intellectual qualities of monkeys are not of very high order. In this attribute, they are surpassed by the dog, the horse, and the elephant. There is especially no trace of those qualities of fidelity and gratitude which we so highly value in the animals last mentioned.

All of the American monkeys are true monkeys, but in the old world there is no line between ape, baboon, gibbon, macaque and monkey. Most of the American species (the marmosets excepted) have one more molar tooth on each side of each jaw than does man, but the forms of the eastern continent are like man in that respect, as they are in having nails rather than claws on at least some of the fingers and toes. Many of the new world species have prehensile tails, but this never occurs in the others, the tail exhibiting a tendency to be reduced, at last disappearing in the man-like apes.

The American apes have the nostrils widely separated and opening sidewise, while in the others they open in front and downward as in man.

Monkeys are extremely interesting because of their caricature of man. Some make most interesting pets, and others are disagreeable, in looks, temper, and habits. Most of them are vegetarians for most of their diet, but they are fond of eggs and young birds, as well as insects. None stray far out of the tropics and only one enters Europe at Gibraltar.

There are over one hundred various kinds of monkeys, only a few of which it will be necessary to describe with more detail.

Baboon (*Cynocephalus babuin*).—The Greek name, signifying "dog's-head," is very appropriate to the baboons, for they resemble a dog both in the shape of the head and in the hairy covering of the skin, and even in the tone of the voice.

They are very powerful animals, with protruding jaws like those of a bull-dog. Their jaws, supplied with immense incisor teeth, would do honor to any beast of prey, and their whole expression is fierce and malicious. Their limbs are strikingly short in comparison with those of the monkeys mentioned above. The baboons are found in Africa and the East Indies, and live chiefly in rocky and hilly regions, avoiding the woods as far as possible.

Their food consists of all kinds of plants, fruits, herbs, grasses, bulbs, etc., and also of small animals, especially snails, insects, and spiders. The structure of their body prevents them from walking upright, and their whole behavior, whether at rest or when running and jumping, exhibits a malicious disposition. Notwithstanding the fierceness of their nature, they may be tamed and made obedient when young; but their innate malicious nature reappears in old age. They are then no longer obedient, but again grin, scratch and bite.

Chimpanzee (*Simia troglodytes*) attains to the same height as the orang-outan; its body is covered with dark hair, and its hairless face is of a leathery yellow. It lives in forests, and is social and much livelier than the orang-outan, but it is also extraordinarily fierce. It builds hut-like constructions in the trees. The chimpanzee cannot live longer than a few years in our climate.

Douc (*Semnopithecus nemæus*).—The douc, or variegated monkey, is a native of Cochin-China. Its tail is almost as long as its body. From its variegated external appearance this monkey might be called a clown; its jacket is grey; its breeches, head-band, and gloves are black, its stockings brownish red; its sleeves, beard, loins, and tail white; its face yellow; and its necktie brownish red.

It is timid and shy, and at the sight of man quickly makes off into the recesses of the forest. It does not live long in captivity.

Galago (*G. senegalensis*).—They vary from the size of a rabbit to that of a rat, are covered with thick, soft, wooly fur, have somewhat bushy tails longer than the body, and hind-legs longer and stronger than the arms. The head is round like a cat's; the eyes are large with oval pupils contracting in daylight to vertical slits; the ears are naked and very big, expanded during activity, but rolled together when the animal rests. The digits are strong and well adapted for grasping the branches; all bear nails except the second on the hind-foot, which is clawed. The galago proper is a pretty animal with wooly fur, grayish fawn above, whitish beneath. It seems to be distributed throughout tropical Africa, and is known in Senegal as "the gum animal" from its frequent habitat in mimosa or gum-acacia forests.

Gorilla (*Simia gorilla*) is the largest of the monkeys, growing to a height of six feet. Its grey, sparkling eyes are deeply sunk, and the powerful bony forehead gives the face an expression of wild ferocity. The mouth is wide, and the lips are sharply cut, without any red at the edges; the jaws are extremely powerful, and are armed with strong incisor teeth. The eyes stand wide apart, and the nose is more prominent and the head better formed than is the case with the other monkeys.

Howling Monkey (*Mycetes niger*).—The coat of the male is black, that of the female rather brown. Their tails are what are known as prehensile tails, and are of great service to them when climbing. The howling monkeys are found in South America. They live chiefly in the dense, damp woods, and along the banks of rivers. Every morning and evening their dismal howling fills the hearer with horror. They sit or lie about in the trees, and sometimes hang from the boughs by means of their prehensile tails. Their faces have a serious expression, and are surrounded by long beards. Their dismal chorus is begun by one of the old monkeys, and the whole company afterwards join in, the concert often lasting several hours.

The Indians hunt the howling monkey and eat its flesh; but it very often escapes the hunter, even after having been mortally wounded; for while in the act of falling down from the tree it will twist its tail around a bough, and remain there suspended long after death.

Mandrill (*C. mormon*).—This monkey has a repulsive appearance. The high puffed-up cheeks are blue with red lines, the nose a fiery red, the hair of the head greyish green, and the whiskers lemon yellow. It is as malicious and violent as it is rapacious, and is found on the west coast of Africa. It is much feared on account of its strength. As it feeds chiefly on plants, it frequently does a great deal of damage; troops of these animals are said to have invaded the inhabited districts on the coast.

The mandrill does not fear man, and is never to be frightened by a gun-shot; the smallest trifle suffices to put it in a most violent rage. The natives very rarely dare to enter the forests in which the mandrills are known to live.

Marmosèt (*Hápale Jacchus*).—One of the few monkeys that can with truthfulness be termed pretty is the Marmoset. There are several species, and all are beautiful, with the gentle, engaging manners. Only seven or eight inches long, or about as big as a full-grown rat, the thick, soft fur and the long, bushy tail, a foot

ANIMALS THAT INTEREST US AT THE ZOO

MARKHOR (Page 202)

WHITE MONKEY (Page 191)

SAMBUR (Page 202)

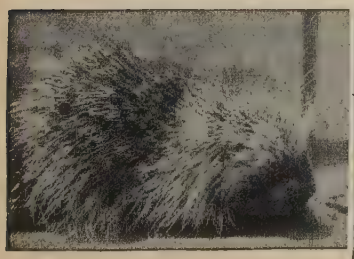
PRAIRIE WOLF (Page 197)

TAHR (Page 202)

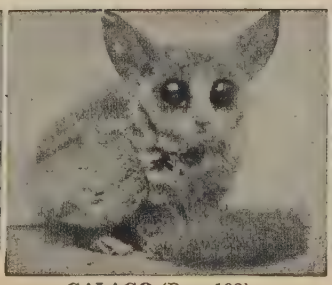
OPOSSUM (Page 205)

KOALA AND CUB (Page 204)

WHITE WOLF (Page 197)



PORCUPINE (Page 199)



GALAGO (Page 192)

HEDGEHOG (Page 195)

in length, give it the aspect of a considerably larger animal. The color of the coat is a peculiarly rich brown, which appears quite ruddy when the hairs are blown aside. The tail, which is not prehensile, is light grey, ringed with black, and there is a prominent tuft of white hair on either side of the head, standing out before the ears. The Marmoset has claws instead of nails except on its great toe. Its voice is a low, gentle whistle, quickly repeated when alarmed. It is common in many parts of South America. Its chief food consists of fruit, but it is very fond of insects.

Orang-Outan (*Simia satyrus*).—The orang-outan is found in the islands of Borneo and Sumatra. It attains to a height of four and a half feet. The face and the inside of its hands are hairless, and are of a bluish-grey tint; but the other parts of its body are covered more or less thickly with hair, generally of a rusty-brown color. Its hands reach almost to the ground.

When at liberty it feeds on plants only, and especially on tree-fruits. Hard shelled-fruit, as big as a human head, which a man could only open with an axe, the orang-outan tears asunder with its hands. It is by no means so lively as the monkeys, and sits for hours at a time in a melancholy mood on the bough of a tree, exhibiting only the natural fierceness of its class when attacked.

In youth it is sociable, and lives with others of its kind, but when old it leads a more solitary life; the old males are especially fond of solitude. With increasing age the orang-outans scarcely ever climb the trees. On the ground, however, they move with difficulty, and their gait is awkward and clumsy. They build a kind of nest in the thick branches nineteen or twenty feet above the ground. Their attachment to their young is very touching.

Wanderoo (*Macacus silenus*).—A remarkable species which the Ceylonese call Black Monkey, on account of the color of its long fur. On the top of its head the hair is particularly long, falling on either side of its face like the full-dress wig of a judge. It also possesses a long grey beard, so that it has quite a venerable aspect. Unlike the other macaques, it has a tuft of hair on the end of its tail, much like that of a lion. The wanderoo is furnished with cheek pouches of considerable size; and probably the rapidity with which it feeds is due to the fact that it is storing away a portion of its food for future use. The animal stands about thirty inches high, weighs as much as eighty pounds, and is possessed of considerable muscular power.

THE ANIMALS OF PREY

The animals of prey proper are very powerful, and some of them are even dangerous to man; they feed on the flesh of other animals. The Insectivora, or insect eaters, are, on the contrary, small; they feed chiefly on insects and worms, and are therefore useful. Of these several groups are distinguished: the cat-like, hyaena-like, dog-like, marten-like, and bear-like animals of prey.

Badger (*Meles taxus*).—The compact body of the badger is covered with blackish fur, with white stripes at the neck and head. It lives in forests, near fields and vineyards, where it digs burrows, with about six to eight passages leading to a kettle-shaped chamber, which lies from four to six feet under the surface. It sleeps in the daytime and during the winter, but at night it goes out on its predatory excursions. Its food consists of insects, worms, snails, frogs, snakes, birds' eggs, young birds, and young hares; nor does it despise fruit, roots, and honey. The badger is very wary, and defends itself with great courage in its burrow. It is hunted chiefly for its fur; its flesh is rarely eaten. Paint brushes are made from its hair.

Bear, Brown (*Ursus arctos*), also called the common or European bear, has a shaggy light or dark brown fur. It is only about five feet long, and attains a weight of five hundred to six hundred pounds. Its home is in the temperate regions of Europe and Asia. Although not so strong as the polar bear, it is not to be despised as an adversary. It is the king of the northern forests. When attacked it will place itself in an erect position, and try to tear its enemy with strokes of its paws. In the fables of animals it is represented as an awkward, foolish simpleton, who is always brought to shame and disgrace by the cunning of the fox. It can easily be tamed, and nearly everybody has seen its clown-like performances.

Its habitation is in caverns or hollow trees. Its flesh is eaten, and its fur used like that of the polar bear.

Bear, Polar (*Ursus maritimus*).—Its fur is quite white. Its body attains eight feet in length, and weighs from fifteen hundred to sixteen hundred pounds. It inhabits the most northern parts of Europe, Asia and America. Its movements are equally quick on water and land; and it is a terrible animal of prey, attacking even man with the greatest fury. It pursues its predatory excursions on the numerous islands of the northern polar regions, and its chief food is fish and seals. Sometimes it will come into more southern latitudes, when it causes terrible havoc among the herds, and only with the greatest difficulty can this strong and fearless animal be killed. The polar bear has its home in the regions of everlasting snow, and can only obtain the necessaries of life by means of never-ceasing activity. It often uses a sheet of ice as a raft to transport itself to spots where it can obtain its prey. Its flesh is eaten; its fat is used for food and fuel, and its fur for carpets and rugs.

Caracal (*Felis* or *Lynx caracal*), a species of lynx found in the warmer parts of Asia and throughout the whole of Africa. It is larger than a fox, about the same height, but much more powerful; of a uniform deep chestnut color, except two spots near each eye, the under parts of the body, and inner parts of the legs, which are white, and tufts of long black hair which terminate the ears. The young forms are spotted. The ears are about three inches in length. The caracal is powerful enough to tear a hound to pieces.

Fox (*Canis vulpes*).—The common fox, also called red fox, has thick, soft fur, which is, on its upper parts, a light rust red, and on its lower parts whitish. Its body attains a length

of thirty inches. Its long tail is bushy, and ends in a white tip.

The fox is a common inhabitant of the whole of Europe, and of the northern parts of Asia, America, and Africa. It inhabits forests and woods, where it lives with its mate in caverns. In rapacity it is nearly equal to the wolf; but it can master its cupidity and wait for better opportunities if danger should threaten. No animal is the subject of so many fables. "Master Reynard" is always the cunning rogue, who outwits his adversaries. Only on behalf of their young will the male as well as the female fox risk their lives; intense love will then overcome every fear and precaution.

The fox hunts hares, fowls, geese, and ducks, and even fish; but it always destroys a great number of mice, whereby the injury done by it is partly equalized. Its cover has always several exits. If found to be rather deep, it was not constructed by the fox, but by a badger, which either left its burrow willingly or was driven out by the new tenant. The fox is hunted in different ways.

Hedgehog (*Erinaceus Europæus*).—The hedgehog is likewise an inhabitant of the underground world, for it lives in holes below the roots of trees, and under heaps of stones. Its body, with the exception of its belly, is covered with sharp spines, and its feet are short and strong. It begins to hunt for its prey in the darkness of the night. Should it be disturbed it will suddenly roll itself up into a ball, its sharp spines projecting in all directions. In this condition no dog can get at it; but, if water is poured on it, it will unroll again. Its spines are also of great service to it in other ways; for when rolled up it can let itself down the steepest precipices, and fall from walls ten feet high, without sustaining the smallest injury.

The hedgehog may also be called a useful animal; for it destroys mice, rats, and vermin of all kinds, and will even feed on vipers, as poison does not effect it. Its flesh is eaten in some countries.

Hyena (*Hyæna maculata*).—This whitish-grey and white-spotted animal attains a length of four feet, and has its home in Southern and Eastern Africa. It has a repulsive appearance, and emits a very disagreeable odor. Hyenas remain hidden during the daytime; in the evening and during the night they go out in quest of prey. They are great cowards, and sometimes encircle human habitations in troups, and fall on their sleeping prey. Hyenas force their way even into villages, clear off the decayed animal matter, and dig the corpses out of their shallow graves. The HYENA DOG (*Canis pictus*) does not belong to the hyenas proper, but to the dog-like animals of prey. It inhabits the central and southern parts of Africa, and is very dangerous to the antelopes and the herds of sheep; it also attacks cattle.

Ichneumon (Herpestes ichneumon).—This animal is also called Pharaoh's rat. It inhabits Africa, and was considered a holy animal by the ancient Egyptians. The color of its hair is greenish-grey, somewhat darker on the head and back. Its snout is rather short; its tail ends in a tuft. It feeds on rats, mice, toads, frogs, and snakes, birds' eggs, and the eggs of crocodiles.

Jackal (*Canis aureus*).—Very similar in appearance to the fox, the hair of the jackal is of a dark rusty yellow, whitish on its lower parts. It inhabits Asia and north Africa, and is also found in the south-eastern parts of Europe, in Greece, and Turkey. It makes its excursions during the night in troops. Like the hyena, the jackal prowls round the herds and human habitations, and, failing living prey, is content with carrion.

Jaguar (*Felis onca*), sometimes called the American tiger, has reddish-yellow fur, spotted with black. It inhabits South America, from Paraguay to Mexico, and is the largest and most dangerous animal of prey in those parts of the globe. The jaguar lies in wait for all sorts of animals, and shows a great fondness for fish; but most frequently it attacks grazing animals. It does not even hesitate to spring upon man.

Leopard (*Felis pardus*).—Now generally supposed to be identical with the panther. The leopard is at home in Africa, from Algeria to Cape Colony; it is also found in Asia, from Palestine through central Asia to Manchuria. It is characterized by a peculiar gracefulness, slenderness and flexibility of form, with a very long tail, and spotted fur, the spots being arranged in numerous rows along the sides, and each spot composed of five or six small spots arranged in a circle or rosette. The general color is yellowish; the lower parts lighter; the spots darker than the general color of the fur. The leopard is extremely agile, and possesses the power of leaping and also that of climbing trees in great perfection. Deer and antelopes are its habitual prey; but it is equally ready to feed on pigs, poultry, or whatever animals may be found in the vicinity of a farm or village. The size and strength of the leopard render it dangerous to man; but is generally seems to dread and flee from man, unless assailed.

Lion (*Felis leo*).—The lion is covered with short, smooth hair, which lies close to the skin. Its fur is mostly of a uniform yellow color. A male lion measures about ten feet in length; the female is about a foot shorter. The male has a long mane on its neck and breast. Its claws are retractile—*i. e.*, may be drawn back entirely into their sheaths. At the end of the tail is a horny point, which is surrounded by a tuft of hair.

The lion, the king of animals, inhabits the Old World, Africa and Asia, and was formerly also found in Greece and Macedonia. The majesty of terror and violence accompanies its movements. Its most striking qualities are courage, pride, and circumspection. It chooses lonely spots with rocky caves for its habitation, where it passes the day in sleep.

At the beginning of twilight it rises from its couch, stretches its limbs, and gives vent to a roar which makes man and beast tremble far and wide. Then it begins to roam through the neighborhood; and woe to the animal or man who approaches too near to it! It crouches like the cat, and will sometimes spring thirty feet. The results of such an attack are

terrible; for with one stroke of its paw it can kill a galloping horse, together with its rider. But it rarely attacks man.

The lion often overcomes animals larger than himself by means of his stealthy, cat-like habit of springing upon them unawares. He preys upon buffaloes, zebras, and even young elephants. Lions sometimes go in troops, being sociable rather than gregarious. The male aids in care and feeding of the young, which number from two to four, usually three, at a birth. The pupil of the lion's eye is circular when contracted, not a narrow slit, as in the cat. The papillæ of its tongue are so large that it can rapidly rasp the flesh from bones by licking them.

Lynx (*Felix lynx*).—This animal, which is widely spread, is of a reddish grey, with darker spots on its upper parts and white on its lower parts. It is frequently seen upon the Alps, the Carpathian Mountains, and in the north of Europe and Asia. Hidden in the tops of low trees, it lies in wait for the passing animals, and springs even upon horses and stags. It commits great havoc among game, and is therefore eagerly hunted. Every year about fifty thousand furs of the common lynx and its nearest relations, the desert, polar, red, pardel, and bog lynx, are sold in the markets of the world.

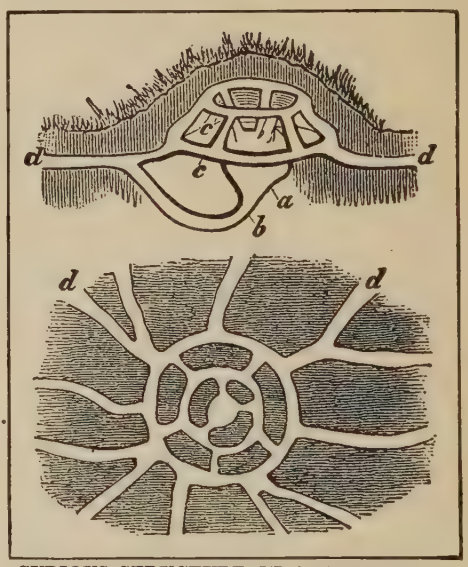
Marten (*Mustela martes*).—The tree marten has a yellowish-brown fur and a reddish-yellow patch across its breast. It inhabits Europe and the western parts of Asia. It is always found in forests, where it lies hidden in hollow trees. It not only causes great destruction among game, but is also a great robber of useful birds. It also hunts squirrels, which, as soon as they get sight of it, try to escape as rapidly as possible.

Related to the tree marten are the Stone or House Marten (*M. foina*), which generally lives in the neighborhood of human habitations, and destroys poultry and eggs: the Pole Cat (*Putorius fœtidus*), which lives in the same localities and has the same injurious habits as the house marten: the small Weasel (*P. vulgaris*), is reddish brown on its upper parts, but on its lower parts whitish, and is over seven inches long. It is a useful animal, as it feeds chiefly on rats, mice, and badgers; it is also fond of eggs, which it carries under its chin: and the Ermine (*P. ermineus*), the fur of which is of a dazzling white color in the winter, and is the most valued of all furs.

Mink (*Putorius*), a name applied to several carnivores in the same genus as weasel, polecat, ferret, and ermine, and with essentially similar characteristics. The body measures from twelve to eighteen inches in length, not including the bushy tail. The color of the valuable fur is chestnut-brown. The Siberian vison (*P. sibericus*), the European vison (*P. lutreola*), and the American mink (*P. vison*) are very nearly related. They all live by rivers and lakes, feeding chiefly on fishes, frogs, mussels, and the like; though not refusing any small mammals which come in their way.

Mole (*Talfa Europea*).—The mole is one of the most interesting of the smaller animals. It inhabits meadows, fields, gardens, and forests where it finds its food. It lives in the earth, and digs out its "runs," at the same time throwing up mole-hills. The mole feeds on grubs, caterpillars, chrysalises, maggots, crickets, lizards, snakes, frogs, mice, and rats, and does not even spare its own kindred. The formation of its body, which is about six inches long, enables it to seize these different kinds of prey with ease; for it is cylindrical and wedge-like in shape, with a long, flexible snout, and very large fore paws, furnished with five strong nails. Its head is placed deep between the shoulders—no neck is visible; its eyes are very small, and covered with hair; and there are no exterior ears. Its hind paws are longer but weaker than the fore limbs, and its tail is short. Its fur consists of short, velvety hair.

The mole nearly always lives a solitary life. It is very quarrelsome and rapacious. The weasel, fox, marten, hedgehog, owl, buzzard, falcon, raven, the viper, and man all threaten its life. Against these enemies it is, however, well protected by its dark fur, by the keenness of its senses of hearing and smell, and by its rapid movements, and the ingenious architecture of its burrow. The latter is a real fortress.



CURIOUS STRUCTURE OF A MOLE HILL

It consists: (1) Of the chief structure, which is about two feet deep, below the roots of trees or ruined walls. This consists again of an almost spherical sitting-room (a), about four inches square, which is stuffed with grass and hay, from which leads a descending passage (*b*). Round the sitting-room there are two circular galleries (*c*), the upper one of which is connected with the sitting-room. (2) Of a number of runs (*d*), which are twelve to sixteen inches long, and radiate in all directions; they are connected with each other by cross passages. (3) Of the chief passage, into which all the runs open in the form of arches, and which leads to the hunting grounds. (4) Of the hunting passages, which run in all directions.

In this burrow from four to six young ones are born between the middle of April and June. The mother nurses them with the greatest tenderness, carrying them away in her mouth whenever danger threatens. But as soon as they are able to take care of themselves the parents drive them out of their home, and begin to lead a solitary life again.

The mole is a very useful animal, because it destroys so many injurious insects. Although it does some harm by means of its mining operations, it is, nevertheless, more useful than destructive, and ought, therefore, not to be destroyed unless absolutely necessary.

Mongoose.—A small carnivorous animal of India, noted as a destroyer of snakes, and accordingly encouraged. It does not hesitate to attack the most venomous serpents, killing them by agility and having no protection against their poison except its hair and ability to dodge the blows. The mongoose and its near relative, the ichneumon of northern Africa, are gray and a little larger than a rat. All make interesting pets.

Ocelot (*Felis pardalis*) is a species, with several varieties, which is confined to the New World, and ranges from Arkansas in the north to Patagonia. These animals are inhabitants of forests, and very expert in climbing trees. Their prey consists in great part of birds. They are beautifully marked and colored. The coloration varies considerably, but the ground tint is always a rich red or tawny color; the head, neck, and legs being also variously spotted or barred with dark brown or black.

Otter (*Lutra vulgaris*).—On the upper parts, the fur of the otter is dark brown, while on the lower parts it is lighter brown. Its body is about thirty inches long, and its tail eight inches; between its toes there are web membranes. The otter is rather a water than a land animal. On land it is clumsy and uneasy in its movements, but in the water quick and persevering. It hunts fish, and its sharp eyes greatly assist it in this hunt. It is very seldom seen, as it is very shy and constantly hiding, mostly committing its depredations during the night. Otter hunting is, therefore, difficult; but in winter, when the snow has just fallen, and the water has been frozen over, the spots may be found where the fish otter enters the water. There it can be killed with a spear.

Puma, Cougar or Mountain Lion (*Felis concolor*).—Generally distributed in North and South America, but rare in those parts which have been long settled. It is sometimes called the American "lion," "panther" (painter), or "catamount." The fur is thick and close, dark yellowish red above, lighter on the sides, and reddish white on the belly; the muzzle, chin, throat, breast, and insides of the legs are more or less white. Young pumas have dark brown spots in three rows on the back, and scattered markings elsewhere. The long tail is covered with thick fur, and is slightly coiled. They are agile in their movements, and can leap and spring well, but swim only under compulsion. Many kinds of mammals fall victims to the pumas, and they are the more disastrous to flocks and herds because of their habit of killing many more than they devour.

Raccoon (*Procyon lotor*).—The fur of the raccoon is a yellowish-grey-black; its body is about twenty inches long, and its tail ten inches. It inhabits North America, and feeds on fruit, birds' eggs, etc. It has received its name because it is in the habit of rinsing dry and blood-stained food before eating it, rubbing it between its fore paws. The eagerness with which it is hunted is best illustrated by the fact that every year about half a million of its furs are brought into the market. The flesh of the raccoon is eaten, and its hair is used for paint brushes.

Sable (*Martes zibellina*), a species of Marten. The feet are covered with fur, even on the soles, and the tail is rather more bushy than in the martens. The length, exclusive of the tail, is about eighteen inches. The fur is brown, grayish yellow on the throat, and small, grayish-yellow spots are scattered on the sides of the neck. The whole fur is extremely lustrous, and hence of the very highest value. The sable is a native of Siberia, widely distributed over that country, and found in its coldest regions, at least wherever forests extend. It is a very wary animal, and not easily captured. It makes its nest in a hollow tree, or sometimes, it is said, by burrowing in the ground, and lines it with moss, leaves, and grass.

Shrew (*Soricidæ*), a family of insectivorous animals closely resembling, in general form and appearance, the true mice and dormice, but in reality widely differing from and not to be confused with those rodents. The shrews have the head small, muzzle long and pointed, eyes small but well developed, external ears usually small; body mouse-like, covered with hair; limbs short, nearly equal in size, the feet not adapted for digging; tail nearly naked and scaly. Along the sides of the body, or at the root of the tail, are peculiar glands, which secrete a fluid of a very strong odor. The shrews are very widely distributed, being found over North America and the whole of the eastern hemisphere except Australia.

The Dwarf-Shrew (*S. pygmæus*) is the size of a cockchafer; it is the smallest of the mammalia, and is so voracious that when hungry it attacks and kills its own kind.

Tiger (*Felis tigris*).—The tiger is the largest and most dangerous of all the animals of prey. It varies from a yellowish brown to a rust red in color. It has neither a mane nor a tuft to its tail. Its length amounts in all to about eight feet, of which thirty-two inches belong to the tail. It inhabits chiefly the southeastern part of Asia. The tiger displays neither courage nor pride; but cowardice, cruelty, and malice, with no trace of majesty. Its strength and rapidity are astonishing. Tigers, when driven by hunger, even enter the villages, and often force the inhabitants to retire altogether. They are especially fond of human flesh. When lying in ambush, their eyes sparkle through the darkness. Horses scent them from long distances; and fear of this terrible foe almost paralyzes them.

Wolf (*Canis lupus*).—The fur of this animal is yellowish grey with blackish spots; in its lower parts its color is lighter. It is the size of a shepherd's dog. Its whole appearance is

unprepossessing; its body is lean and long; its expression malicious; its ears erect. When it cannot obtain its favorite food, game or sheep, it feeds on mice, frogs, and carrion. It sometimes attacks even horses, attempting by a bold jump to seize them by the throat and pull them down. It knows how to avoid their kicks, and also how to secure itself against the horns of oxen. It is ordinarily a coward, like the hyena; but when hungry fears nothing. It carries away sheep under the very eyes of the shepherd, and even forces its way into stables. It is cunning and sly, and knows how to make use of the best opportunities. It is as strong as it is tenacious of life; with a sheep in its mouth it runs off at a trot; sometimes a dozen bullets are not sufficient to kill it.

The wolf was formerly spread over all Europe. At the present time it is still found in great numbers in Hungary, Galicia, Russia, and Scandinavia, in the Alps and Pyrenees, the Ardennes and Bosges, and in the northern parts of America, Africa, and Asia, also in central Asia. It sometimes becomes rabid.

Prairie Wolf, or Coyote (*Canis latrans*) has now been extirpated over large tracts in Kansas, Nebraska, etc., but it may still be found where the common wolf has disappeared, owing to its smaller size and less dangerous character.

GNAWING ANIMALS, OR RODENTS

The rodents are for the most part small animals, but their lack of size is made up by their great numbers. They have in the upper as well as in the lower jaw two chisel-like incisors, and from two to six molar teeth. The latter are separated from the incisors by a great gap. In the hares there are two little tack-like teeth behind the incisors. The incisors wear away on the inside more than on the outside, so that they are always very sharp.

The rodents feed chiefly on plants. Some of them collect food for the winter; others sleep during the whole of that period. They inhabit all parts of the globe, but are more numerous in North America than anywhere else.

Beaver (*Castor fiber*).—The true beaver is now found in only a few places in northern parts of Europe and Asia; but in North America a variety of this animal, the American beaver (*Castor Canadensis*), abounds in great numbers. It is now much hunted, as was formerly the European variety, and the number of beaver furs sold in the markets every year can be counted by thousands.

On the upper parts the fur is dark chestnut brown, while on the lower parts it is lighter; its tail is almost bare, scaly, and twelve inches long; the length of its whole body is thirty-two inches.

Beavers build lodges which contain many compartments, close to rivers and lakes. These lodges consist of branches, tree-trunks, and mud, and are divided into many different compartments. Such habitations are built in pairs, one above the other, and lead into the water. As tools they use their fore feet and their sharp teeth, by means of which they fell stems of the thickness of twelve inches. They are shy, and do not leave their homes before darkness in search of food, which consists of tender barks and other vegetable matter. For the winter they collect large stores of provisions. As the beavers are awkward on land, they try to save themselves by jumping quickly into the water when pursued. They are then in their own element, and are good swimmers and divers. They are caught by means of nets and traps, which are placed close to their lodges. Their soft furs are valuable. Though the subject of numerous stories, the sagacity of the beaver is much exaggerated.

Chinchilla (*C. lanigera*), a South American rodent, well known by its soft, gray fur. Two related animals form, along with the true chinchilla, a small family in the porcupine section of the Rodent order. All the three are somewhat squirrel-like animals, but have long hind legs, bushy tail, very soft fur, and complete collar bones. The chinchilla proper has a body about one foot long, and the tail measures fully six inches. They are extremely active animals, and climb among the rocks with the greatest agility. They are killed in thousands for the sake of their fur.

Dormouse (*Muscardinus avellanarius*) is a pretty little animal, about three inches in length, not including the bushy tail, which is almost as long as the body. The general color is a beautiful tawny yellow, but there is white on throat and breast. It is widely distributed and is especially fond of hazel-copses. It feeds on nuts, seeds, berries, buds, etc., grows very fat in autumn, sleeps intermittently through the winter in a round grassy nest a little above the ground. The loir or fat dormouse (*Myoxusglis*) is about twice the size of the common dormouse, and has the hairs of the tail in two rows, as in squirrels. It is ashen-gray, sometimes brownish above and white below. The favorite haunts are in oak and beech woods.

Hare (*Lepus timidus*).—Hares and rabbits are of various colors, some brown, some grey, while others are whitish; their ears are long; behind the two front teeth, in the upper jaw, are two little tack-like teeth; the small tail is black and white, and the body about sixteen inches long. The name "hare" is given to the large forms, or types and "rabbit" to the smaller.

The hare is found in Europe and Western Asia. It is very timid, and a nocturnal rather than a diurnal animal; but in a quiet neighborhood it is also seen during the day. It does not leave the district in which it was born unless it is forced to do so.

Hares multiply very rapidly, for they bring forth two to five young four or five times a year, for which they construct a kind of nest. The old animals choose a somewhat hollowed-out spot as their habitation, where they are protected against the storms. As they are very fond of cultivated plants, such as clover, carrots, turnips, young corn, and the bark of young trees (especially of fruit trees), they do much damage in fields and woods.

The Rabbit (*Lepus cuniculus*) is widely distributed in North America, and there are numerous varieties. The Jack-rabbit of the west is the largest. The original home of these sprightly little animals was Spain and North Africa.

Lemmings (*Muodes lummus*).—These voracious little animals live in the far north of Europe, and sometimes make migrations in vast numbers, swimming across rivers and lakes, passing through towns and villages, and climbing over mountains and rocks. Troops of birds of prey fly above them, and they are followed by bears, foxes, martens, and weasels, so that their migratory flocks often disappear as rapidly as they make their appearance. They are about the size of a rat. The snowy lemming turns white in winter.

Marmot (*Arctomys marmota*).—The upper parts of the marmot are brownish black, its sides yellowish grey, while its lower parts are reddish brown. It attains a length of sixteen inches, and is found in both Europe and America. In North America, they are popularly termed woodchucks or groundhogs. The marmots live together in social troops in rocky caverns and feed on plants. In the autumn the marmots move into their winter quarters. There they sleep through the whole winter, huddled together in parties of three, five, and more, and apparently lifeless. In this state they can be rolled about like balls without being awakened until Spring, when they are usually hailed as weather prophets. Marmots are easily tamed, and can be trained to perform many tricks.

Mice are the best known of the rodents, which only too often do a great deal of harm by their predatory habits. Of these the domestic mouse (*Mus musculus*), a swift and pretty little animal, which is very much attached to our larder provisions. Even the elephant, the largest among animals, fears this tiny rodent.

The domestic rat (*Mus rattus*) became known in Europe in the twelfth century, and probably emigrated from Asia. The brown rats did not appear in Europe until the eighteenth century. They are stronger than the domestic rats, which they drive away or devour. Their food generally consists in kitchen refuse of all sorts. If driven by hunger they even eat their own kind.

Porcupine (*Hystrix cristata*).—This is quite a remarkable animal. It attains the size of a badger, and inhabits South Europe, Africa, and North America. Like the hedgehog, it is provided with a peculiar muscle, which enables it to erect a coat of spines whenever danger threatens, and it is thus protected against foxes and jackals, which often share the porcupine's habitation, and would very much like to devour their fellow-lodger. In European porcupines, the spines or quills attain a length of from ten to twelve inches. Our American species has quills about three inches in length. The fore feet are supplied with sharp claws, which are very necessary to the animal for digging out its burrow. During the day the porcupines remain hidden in their burrows, but at night they go out in search of food.

Prairie Dog.—This small rodent animal of the squirrel family is found on the plains east of the rocky mountains. It resembles the marmot in appearance, and has well-developed claws on all the toes of the fore-feet; shallow cheek-pouches. The best known species is about one foot in length, and has a tail of about four inches. On the upper surface it is reddish-brown, variegated with gray. These animals live together in great societies on those portions of the prairies where the buffalo grass grows luxuriantly. Here they excavate burrows in the ground in contiguity to each other, and, when the little creatures are out, quite a busy scene is presented. The name is given on account of a resemblance between its cry and the bark of a small dog.

Rabbit. See Hare.

Rat. See Mice.

Squirrel (*Sciurus vulgaris*).—In the summer the squirrel is brownish red on the upper parts and white on the lower parts; in the winter, brown red and light grey mixed. The black, white, and spotted squirrels are rare. The tail of the squirrel is bushy and arranged in two lines of bristles; its ears are adorned with a tuft of hair. Squirrels prefer the forests of trees with pointed leaves to those with broad leaves, and are always in motion, being equally adept in climbing, running, and jumping from tree to tree. They feed on nuts, acorns, seeds of fir trees, young shoots, young birds, and birds' eggs, and do a great deal of harm. They collect large stores for the winter, which they hide in hollow trees. Their nests are globular, and made of bark and leaves; they often build on the top of an old magpie's nest. Their greatest enemy is the tree marten.

HOOFED ANIMALS (*Ungulata*)

It is impossible to overestimate the importance of this order, because all the domestic animals which are used for food belong to it.

The name Ungulata is derived from the Latin word *ungula*, which signifies a nail, claw, or hoof. The Ungulates, which are all vegetable feeders except the pig and the peccary, include the largest of all the mammals, save only the whale and the sea elephant.

Antelope (*Antilopidæ*).—The family of antelopes is a very large one, and includes many important species. It belongs to the order of Ruminants in which the horns consist of a horny sheath, surrounding a bony process of the skull, and are permanent, not annually renewed. The body is slender and deer-like, the feet small and elegant, the tail short and tufted, the hair generally short, and the color often lively. Some species, however, have comparatively long hair; and a few which inhabit cold mountainous regions are clothed with wool mixed with longer and coarser hair, as in the chamois of the Alps, Caucasus, etc.; the Rocky Mountain goat of North America; and the chiru of the Himalayas. The females of many species, as of deer, are destitute of horns; and if they alone came under observation, it would be difficult to say to which genus they belonged. The size is very various; the guevi, or pigmy antelope of Africa (*Antilope pygmæa*), is only eight to nine inches high at the shoulders, while the largest forms measure five or six feet. Almost all the species of antelopes are peaceable, timid animals, and are distinguished by agility and fleetness. most of them are gregarious. Some inhabit plains; others are found only in the most inaccessible mountainous regions; others still, dwell in jungles and deep forests. Many, on the other hand, are water-loving forms, and frequent the banks of rivers.

North America possesses two species, found only in the western parts of the continent, the prong-horn (*Antilocapra*) and the Rocky Mountain goat (*Aplocerus*), which depart considerably from the typical character of the genus. The prong-horn sheds the horns annually like most species of deer. Europe produces only the Alpine chamois and the saiga (*A. saiga*), which inhabits the southern plains of Poland and Russia. Most species are African, and take the place of the true deer in that continent. The Springbok is goat-like in form and movement; the Gnu, with a body resembling that of a horse, but with forward-directed, hook-shaped horns; the Eland, or Cape Elk, with nearly straight backward-directed spiral horns; and the Gazelle, of north Africa, with nearly upright horns and noted for the luster of its eyes. In India is the curious Chickara, the females of which are hornless, while the males have four horns.

Bison.—The name applied to two species of ox. One of these, the European bison, or aurochs, (*Bos bison* or *Bison europæus*), is now nearly extinct, being found only in the forests of Lithuania and the Caucasus. The other, or American bison, improperly termed buffalo (*Bison americanus*), is found only in the region lying north and south between the Great Slave Lake and the Yellowstone River, and is rapidly becoming extinct in the wild state, though formerly to be met with in immense herds. The two species closely resemble each other, the American bison, however, being for the most part smaller, and with shorter and weaker hind-quarters. The bison is remarkable for the great hump or projection over its fore-shoulders, at which point the adult male is almost six feet in height; and for the long, shaggy rust-colored hair over the head, neck, and forepart of the body. In summer, from the shoulders backward, the surface is covered with a very short, fine hair, smooth and soft as velvet. The tail is short and tufted at the end. The American bison used to be much hunted for sport as well as for its flesh and skin. Its flesh is rather coarser grained than that of the domestic ox, but was considered by hunters and travelers as superior in tenderness and flavor. The hump is highly celebrated for its richness and delicacy. Their skins, especially that of the cow, dressed in the Indian fashion, with the hair on, make admirable defenses against the cold, and are known as *buffalo robes;* the wool has been manufactured into hats, and a coarse cloth. The American bison has been found to breed readily with the common ox, the issue being fertile among themselves.

Buffalo. See Bison.

Chamois (*Capella rupicapra*).—This European representative of the Antelope family attains the size of a goat. It is red in summer, and dark brown in the winter, the lower portion of the body being lighter, while a dark, browish-black band reaches from the corner of the mouth to the eyes. It has small, erect horns, which are curved backwards at the tips. The chamois is found in herds, numbering from five to twenty, in the Carpathian Mountains, the Pyrenees, and the Apennines; but most frequently in the Alps of Bavaria and Styria. It feeds on the buds of Alpine herbs and trees. When pursued it will leap down the most precipitous cliffs. The peculiar flavor of the flesh of these animals, especially of the young ones, is greatly appreciated by many persons. Out of their skin, a leather is manufactured noted for its softness. The horns are utilized for handles of various kinds.

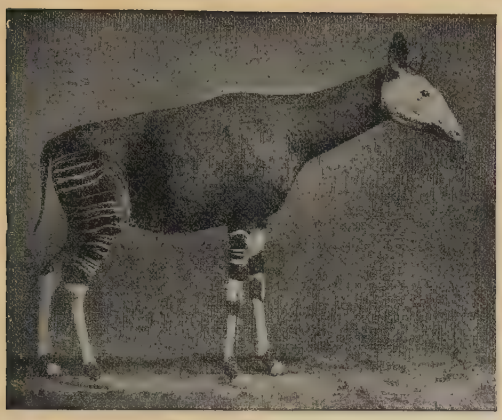
Deer (*Cervidæ*) are animals of graceful form, combining much compactness and strength with slenderness of limb and fleetness. They use their horns for weapons of defense and offense; but in general they trust to flight for their safety. They have a long neck, a small head, which they carry high, large ears, and large, full eyes. Many have scent glands, usually beneath the eyes, which serve as sexual attractions. Deer are distinguished from all other ruminants by their branching horns (antlers), which in most species exist in the male only; they are solid, fall off annually, and are renewed with increase of size, and number of branches, according to the kind, until the animal has reached old age.

Deer are found in almost all parts of the globe except Australia and the south of Africa, their place in the latter region being supplied by antelopes; the greater number inhabit the warmer temperate countries, and they are chiefly found in wide plains and hills of moderate height. The flesh (venison) of most kinds of deer is highly esteemed for the table, and they have long been regarded as among the noblest objects of the chase. Only one species, the reindeer, can be said to have been fully domesticated.

Elk (*Cervus alces*).—This animal is the largest representative of the genus of stags. It is the size of a horse, and its head is adorned with large antlers. The elk inhabits the northern regions of Europe and America. It is hunted for the sake of its excellent flesh, but the hunting of this strong and swift animal is attended with many dangers. It swims across the largest rivers. The Elk of Europe is called Moose in America.

Fallow Deer (*Cervus capreolus*).—Nearly everybody has seen this graceful animal. It attains the size of a goat. The head of the male, the roebuck, is adorned with small but strong antlers, which are shed every year at the end of autumn. The fallow deer go about in troops, and feed on grass, clover, corn, and fruit. Their young are called kids, and the female, does. They are hunted for the sake of their flesh.

Red Deer (*Cervus elaphus*) is much larger than the fallow deer, and is the grandest animal of the higher species of game. The male carries large, branching antlers, which it loses in February of each year. The antlers of the one-year-old stag are like a spear, in the second year they are fork-shaped, and in those appearing later two more prongs are added each year. The stag has a greyish-brown fur. During the day it remains in the recesses of the forests; in the evening and night it roams in herds in search of food, which consists of various grasses and herbs, and the twigs and bark of trees. It runs with great swiftness when scenting danger, and will wade, or swim rivers and lakes.



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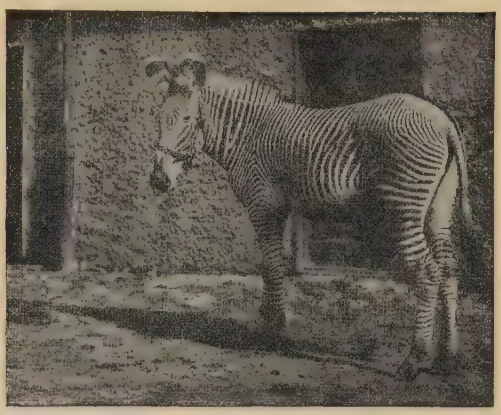


ZEBRA (Page 203)

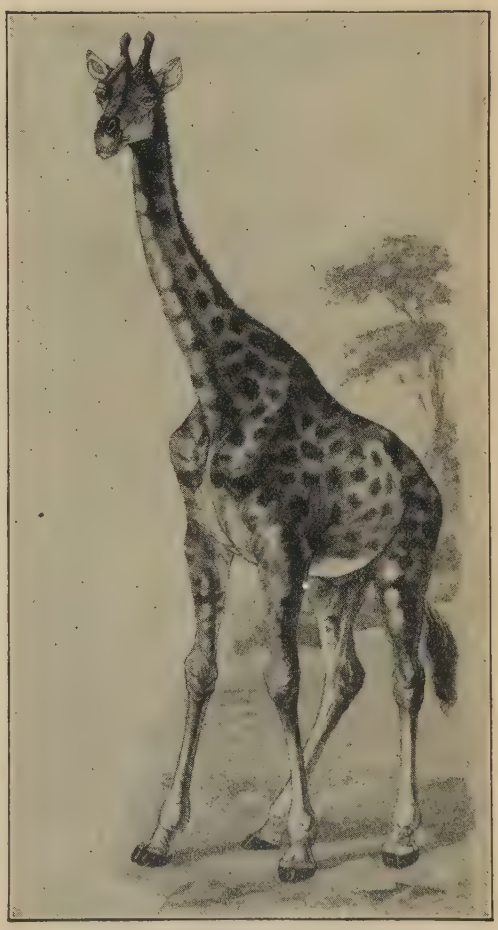
Gayal (*Bibos frontalis*), a species of ox, which is found in the mountains of Aracan, Chittagong, Tipura, and Sylhet. It is about the size of the Indian buffalo, is dark brown, and has short curved horns.

Gazelle (*Gazella Dorcas*), is a species of antelope about the size of a roebuck, but of lighter and more graceful form, with longer and more slender limbs. It is of a light tawny color, the under parts white; a broad brown band along each flank; the hair short and smooth. The face is reddish fawn-color, with white and dark stripes. The horns of the old males are nine or ten inches long, bending outward and then inward, like the sides of a lyre, also backward at the base and forward at the tips, tapering to a point, surrounded by thirteen or fourteen permanent rings, the rings near the base being closest together and most perfect. The ears are long, narrow, and pointed; the eyes very large, soft, and black; there is a tuft of hair on each knee; the tail is short, with black hairs on its upper surface only, and at its tip. The gazelle is a native of the North of Africa, and of Syria, Arabia and Persia.

Giraffe (*Camelopardalis giraffa*).—This strange looking animal has the head of the horse, the neck and hoof of the stag, the callous breast of the camel, and the spotted skin of the panther. On its forehead it has two horny excrescenses. It attains a height of sixteen feet.

The giraffe lives in the wooded plains of central Africa, feeds on the leaves of trees, and is generally seen in small troops. Its rapidity is extraordinary; not even the Arabian horse can overtake it. It is often attacked by the lion, which lies in wait for it near the rivers and springs, where it comes to drink.

Gnu (*Catoblepas*), a genus of antelopes of which the best known species has been often described as apparently made up of parts of different animals, not only of the antelope and the ox or buffalo, but even of the horse. This species (*C. Gnu*) is a native of South Africa; it has disappeared from the more settled parts of Cape Colony, but is to be seen in herds on the arid plains beyond these boundaries in company with small troops of zebras, and with flocks of ostriches. The size of the gnu is that of a large ass; the general color is yellowish-tawny. Both sexes have horns. The limbs are slender, like those of deer and antelopes. The gnu gallops with great speed. It has been usually represented as a very fierce



GIRAFFE (Page 201)

animal, and certainly shows much ability to defend itself with its horns, when unable to escape from danger by flight; but when taken young it is easily tamed, and readily associates with oxen, accompanying them to and from the field.

Ibex or Wild Goat (*Capra ibex*).—Different species of the ibex inhabit the mountain regions of Europe and Asia. It has a greyish-yellow, long fur, and powerful horns bent obliquely backwards. It frequently attains a weight of two hundred pounds. It is a true mountain animal, and was formerly spread all over the Swiss and Tyrolese Alps, but is at present found only in limited numbers.

Markhor (*Copra falconeri*), from Tibet, Cashmere, and Afghanistan, is a strong, powerful goat, with corkscrew horns, much larger in the males, which are also distinguished by a thick mane on the neck and breast.

Musk-Ox (*Ovibos moschatus*).—The Musk-ox, or Musk-Sheep, has its home in central Asia and Arctic America. The male has in its upper jaw two incisors in the shape of tusks, and in a gland of its abdomen the well-known, strong-scented musk. In the forests of the Himalayas it is found at elevations of upwards of eight thousand five hundred feet. A full-grown animal weighs about four hundred and fifty pounds. They live in herds, and feed on mosses, leaves and underbrush.

Okapi (*Ocapia*), a giraffe-like animal discovered by Sir H. H. Johnston in the Semliki forest in central Africa. Its neck and legs are shorter than in the giraffe, ears larger and broader. The general color of the upper parts is a slightly purplish chocolate-brown; buttocks and upper parts of fore and hind legs have wavy black stripes on a buff ground. The living okapi is classed with the giraffe group.

Sambur (*Cervus aristotelis*), a species of stag abundant in the forest-land of some parts of India, Burma, and China. It stands about five feet high, is a powerful animal, and is much hunted. The color is dark brown; the antlers are rounded, and belong to a type known as Rusine.

Tahr (*Hemitragus jemlaicus*), a goat-like animal, differs from the true goats, especially in the absence of a beard. The male is generally from three to three and a half feet in height at the shoulder; the horns seldom exceed fifteen inches in length. The doe is a smaller animal. The coat is fawn brown in color, and is long on the neck, chest, and shoulders. The home of the Tahr is chiefly in the elevated forest regions of the Himalayas; and it frequents almost inaccessible spots.

Vicuna (*Auchenia vicugna*) is a species of the South American animals allied to the camels. The vicuna lives wild, and frequents the most desolate parts of the Cordillera, at great elevations, delighting in a kind of grass, the ychu, which abounds there in moist places. The small herds commonly include from six to fifteen females with one male. When the females are quietly grazing, the male stands apart, and carefully keeps guard, giving notice of danger by a kind of whistling sound, and a quick movement of foot. The soft wool is much valued for weaving.

Wild Goats.—See Ibex, Markhor, Tahr.

Zebra (*Equus zebra*).—The true zebra is a native of South Africa; lives in troops, and is very swift and savage, and therefore difficult to tame. Its general color is creamy white, marked with black cross-stripes everywhere except the belly. The Quagga, its nearest relative, has legs and entire hind-quarters unstriped. It is hunted by the natives for the sake of its beautiful fur and its savory flesh and is also a favorite food of the lion.

PACHIDERMS (*Pachydermata*) **OR THICK-SKINNED ANIMALS**

The animals belonging to this division are mostly of immense size, and are very thick-skinned and scantily covered with hair; they are therefore called "Pachydermata."

Elephant (*Elephas*).—There are two species of the Elephant: the African elephant and the Indian Elephant (*Elephas Indicus*). The elephant is the largest of the land animals. It has been known to live from one hundred to four hundred years, and weighs from six thousand to eight thousand pounds. Its height reaches ten feet, its length from thirteen to sixteen feet. Its thick, wrinkled skin is covered with a few bristles. The eyes are small, the ears large, and its nose is prolonged into a long, flexible trunk. In the upper jaw of the male animal are two tusks (or thrusting teeth), which are from three to six feet long, and from thirty to seventy pounds in weight; these furnish valuable ivory. The tail is long, and has at its end a tuft of coarse bristles. The elephant is a native of central Africa.

The Indian elephant lives in herds of from thirty to two hundred, and is fond of marshy districts. It feeds, in its wild state, on the leaves and twigs of trees, and is a harmless, peaceable animal, so long as it is not provoked. It does great harm to the plantations of rice, sugar, and coffee whenever it forces its way through them. Its docility and prudence are astonishing; its senses of smell and hearing are also greatly developed.

The first elephants are mentioned in the history of Alexander the Great. He brought three hundred of them from India to Babylon. At present they are little used as domestic animals, although many are still kept for that purpose in Ceylon and Burma. They are eagerly hunted for their tusks. About ten thousand are said to be killed annually.

Hippopotamus (*Hippos amphibius*).—There is only one species of the hippopotamus now living—that of Africa. It is nearly as tall as the rhinoceros—viz., about five feet; but it exceeds twelve feet in length. The eyes and ears are small, its neck short and thick, and its feet clumsy. Its incisor teeth grow from twelve to eighteen inches long, and weigh from two to six pounds. It is found in all lakes and rivers, and its principal food is grass; sometimes it commits great ravages in the plantations. It is by nature peaceful, but when provoked gets into a violent rage. Some consider its flesh savory. Its skin, when cut into strips, is manufactured into whips; its teeth are worked like ivory, and are especially used for the manufacture of artificial teeth.

Rhinoceros (*Rhinoceros*).—The Indian rhinoceros and that of Java have only one horn on the nose, while the African species has two.

The white rhinoceros of Africa is the largest, attaining to a length of over twelve feet, and a height of nearly six feet; but the black rhinoceros is best known. These awkward animals are enveloped in a wrinkled and bare hide, which may be compared to a coat-of-mail. They live either solitary or in small herds, in marsh and well-watered districts, and feed on grass, leaves, and roots. They only attack an enemy when provoked. Their horn is a terrible weapon. It is a bony excrescence, extremely sharp-pointed, and is used for ploughing up hard ground, or uprooting strong trees. When fighting with the elephant the rhinoceros attempts to rip up its enemy's abdomen.

Tapir (*Tapirus Americanus*).—This denizen of South America lies concealed in the recesses of the forests during the day, but in the evening and early morning it frequents the marshes and rivers, where it wallows in the mud with its young. It feeds on the branches of trees, but also ravages the fields. All are bulky beasts, recalling somewhat the swine in appearance. They have the snout prolonged into a flexible proboscis with the nostrils at the tip. Their flesh is said to be good.

Wild Pig (*Sus scrofa*) lives in herds in the well-watered forests of central and southern Europe, in central and western Asia, and in north Africa. The adult males are called boars, the females wild sows, and the young shoats. They feed on the fruits of forest trees, roots, etc., and do great damage in the fields by raking up the earth for long distances. For this reason and also for the sake of their flesh they are hunted.

TOOTHLESS ANIMALS (*Edentata*)

Some of the animals belonging to this division have no teeth at all, and all are without the front incisors. They are slow, stupid animals, and work only in the night-time. They are all inhabitants of Brazil with the exception of two species. Nearly all are provided with very long claws. They live in trees or in subterraneous passages.

Ant-eater or Ant-bear (*Myrmecophaga jubata*) attains a length of six feet six inches, of which its long-haired, plumy tail takes twenty-eight inches. The color of its hair is blackish brown; it can project its worm-like tongue to a distance of sixteen inches. The Great Ant-eater is a native of Brazil and Guiana, and much the largest of all the species.

The ant-eater inhabits the same regions as the sloth. It feeds on ants and termites. Raking up the habitations of these insects with its sharp claws, it inserts it proboscis, and begins to work with its viscous (sticky) tongue, to which hundreds of ants remain sticking.

Armadillo (*Dasypus peba*).—A mammal peculiar to South America, consisting of various species, belonging to a family intermediate between the sloths and ant-eaters. They are covered with a hard bony shell, divided into belts, composed of small separate plates like a coat of mail, flexible everywhere except on the forehead, shoulders, and haunches, where it is not movable. The belts are connected by a membrane, which enables the animal to roll itself up like a hedgehog. These animals burrow in the earth, where they lie during the daytime, seldom going abroad except at night. They are of different sizes; the largest, *Dasypus gigas*, being three feet in length without the tail, and the smallest only ten inches. They subsist chiefly on fruits and roots, sometimes on insects and flesh. They are inoffensive, and their flesh is esteemed good food.

Pangolin (*Manis longicaudata*).—There are several species of these scaly ant-eaters. They are found in Africa and Asia, and are covered with dark brown scales, which are arranged one above the other like tiles. When danger approaches the pangolin does not run away, but rolls itself together into a ball like the hedge-hog.

Sloth (*Bradypus pallidus*).—The general color of the sloth is reddish grey, its abdomen lighter. It is about sixteen inches in length, and has three long claws on each foot.

It inhabits the thickets of the virgin forests of Brazil, passing its life in laziness upon the tops of trees, the leaves of which form its food. During the day it hangs down asleep from a bough, and is then only discovered with difficulty. In the same position it creeps along the boughs, and does not leave the tree until the latter is stripped of all its leaves and fruits. When it descends to the ground it is very helpless, and can neither walk nor stand. It gives the best proof of its skill when climbing, hanging down from a bough by means of one of its feet, while it seizes the fruits with the other. It sometimes pierces the large snakes of Brazil with its long claws, so that they die from loss of blood. Its attachment to its young is very touching and the mother carries them on her back from bough to bough.

POUCHED ANIMALS (*Marsupialia*)

The marsupials have in the abdomen a pouch, a sort of bag or purse, in which they carry about their young. In some species the hind legs are developed to an extraordinary degree, whereby they are enabled to jump great distances. Their original home is Australia; but several species are also found in America. They feed partly on plants, partly on animal matter.

Kangaroo (*Macropus giganteus*).—The fur of the kangaroo is greyish brown, somewhat lighter on the sides, while the lower parts are whitish. Its body is six feet long, and its tail nearly three feet. It inhabits Australia, and is found chiefly in New South Wales and Tasmania. It is the largest quadruped of that part of the globe. The front of its body is extremely slim in proportion to its hind quarters, and its hind legs are five times longer than the front ones. The kangaroo is a peaceful, shy, grazing animal. When startled it tries to get away from its pursuers by immense bounds. Its swiftness is so great that, at least across flat country, the fastest dog cannot equal it. But when it is brought to bay it will defend itself most pertinaciously with its sharp claws, and with powerful strokes of its tail. It will seize even large dogs with its fore feet, and tear open their breasts and abdomens, often carrying them to neighboring water to drown them. The flesh of the kangaroo is eaten; its hair makes a good fur.

Koala (*Phascolarctus cinereus*), a marsupial, restricted to eastern Australia. The toes of

the fore-feet are in two opposable groups, of two or three, a characteristic not found in any other quadruped, but well adapted to grasping the branches of trees, on which the koala often hangs with its back undermost, like the sloth. There is scarcely any rudiment of a tail.

Opossum (*Didelphys virginiana*).—The American opossum is perhaps the best known and certainly not the least interesting of the pouched animals. It abounds in the warmer parts of North America, extending considerably north of Virginia. In form it is robust and in size about that of an ordinary cat. The color of its fine wholly fur ranges from white to black, and includes numerous varieties of intermixture. They have a long tail, which is almost destitute of hair, and is very useful from its prehensile nature, enabling the animal not only to hang by it, but also to climb and descend trees. They are sly and live chiefly in trees, lying up in the daytime, and at night roaming in search of their food, which consists of insects, small reptiles, birds' eggs, etc. Caught red-handed in one of its marauding excursions, or captured under any other circumstances, the slightest blow causes it immediately to feign death, even to the extent of a protruding tongue and film-covered eyes. It may be battered almost beyond recognition and will lie where it has been flung without so much as the flicker of an eyelid. The moment, however, that its captor takes attention from it, the presumably dead animal regains its feet and effects its escape. "Possuming" is a slang term that has come into use to denote the acme of human artfulness and deceit.

A wonderfully pretty species of opossum which lives in Surinam is scarcely larger than a good-sized mouse, the body measuring only six inches from the nose to the root of the tail. It has scarcely a vestige of pouch, and so, robbed of this advantage, it carries its young on its back, curling its tail over, so as to allow the little ones to twist their tails around it. With her progeny thus secured from falling the mother can pursue her way in comfort. Even some of the larger opossums adopt this method of carrying their young.

BATS AND OTHER FLYING MAMMALS

A Bat is provided with true wings, with which it is able not merely to propel itself through the air for a longer or a shorter distance, but to fly like a bird by beating the air with its anterior members. The Colugo, in common with the Flying Squirrel and the Flying Phalanger, has the skin of the flanks extended in a manner capable of sustaining the animals, very much in the manner of a parachute, in an extended leap through the air. But bats possess the power of true flight. They move through the air with ease, and in pursuit of their insect-prey wheel and double and circle about with a nimbleness that the human eye can only follow with difficulty.

The bats are strange looking animals, being half mouse, half bird; their fore limbs are very long, and between these and the hind limbs, and also generally extending to the tail, there is a delicate membrane, which enables them to fly. Their eyes are small; their large ears erect; their teeth sharp. The flight of the bats is swift and noiseless, but not enduring. They could not, like the migratory birds, fly off in the autumn towards warmer countries. Therefore in the winter they retire into clefts and crannies, where they suspend themselves by the claws of their hind feet, and sleep until the rays of the spring sun warm their benumbed limbs. Our native bats feed upon insects, and are consequently useful. In the warm summer evenings they can be seen flitting around the blossoming trees in order to catch the honey-sucking moths. They do not build any nest for their young, but the latter cling between the folds of the wings of the parent animal, and are thus carried about by her on her excursions.

The best known of the foreign kinds are the vampire bat of South America and the colugo bat. In the flying lemur, or colugo, the hairy fold of skin begins behind the throat, includes fore and hind limbs as far as the claws, and extends along the tail to the tip. The animal has been observed to swoop over a distance of seventy yards. The flying lemurs are about twenty inches in length, are natives of the Indian Archipelago, inhabit lofty trees in dense forests, and feed chiefly on leaves and fruits, though said at times to eat insects, eggs, and even small birds. They are nocturnal in their habits, and very inoffensive, scarcely attempting to bite even when seized. Their voice resembles the low cackling of a goose.

THE SEALS (*Pinnipedia*)

In the seals the five toes of the limbs have become palmate, being joined together by a web; the hind feet have a backward, horizontal direction. Their food consists of small marine animals and plants.

Seal (*Phoca vitulina*).—The habitat of the common seal is spread over a large area, but it is chiefly found in the northern seas. It is nearly six feet long, and its fur is yellowish grey, sprinkled above with dark-brown spots. It has no exterior ear. To the inhabitants of the north the seal is a most useful animal; its flesh and fat form their chief food, with its oil they illuminate the long winter nights, its sinews they use as thread, from its bones they make various domestic implements, and with its fur they cover their tents and sledges. Seals are gentle animals, and when tamed exhibit great attachment to man. When wounded they snap savagely in all directions. Seal-hunting forms one of the most important branches of commerce among seafaring nations. Over a thousand vessels leave America every year to take part in seal-hunting; and as one vessel will sometimes capture nearly two thousand seals, some idea may be obtained of the immense number of these animals which are slain annually.

Walrus (*Trichechus rosmarus*).—This animal is from eighteen to twenty-two feet long, and weighs from two thousand to three thousand pounds. It is easily recognized by the long tusks in its upper jaw, which attain a length of eighteen to twenty-four inches.

The walrus lives in the northern Polar seas, where it is sometimes met with in herds of a thousand to two thousand head. They either swim about in the water or lie basking in the sun upon ice-floes. When they are about to sleep one remains awake as sentinel. They

FLYING-FOX WITH OUTSPREAD WINGS. ITS ANCESTORS ONCE WALKED THE EARTH LIKE OTHER MAMMALS

A FLYING FROG

It glides through air by means of the membranes uniting the toes, but is not capable of sustained flight.

SQUIRREL-LIKE PHALANGER

COMMON BAT

The bat is the only animal, outside of the birds, that can really fly in the true sense.

attract whole herds to their assistance by their terrific roaring, which can be heard for several miles; in all directions their black heads, with red, dilated eyes, and gleaming tusks, emerge from the water. The walrus is hunted for its tusks, skin and oil.

Sea Lion (*Otaria stelleri*).—The home of the Sea Lion is Bering Sea, and as far South as the Kurile Islands on the one side of the north Pacific and California on the other. In the latter case a rookery of sea lions is strictly preserved by the American Government, or probably long ere this the animal would have been exterminated in those waters, as it has been in many other regions after a century and a half of constant persecution.

The male sea lion, of eleven or twelve feet in length and a thousand pounds in weight, is yellowish-brown in color with shaded darker patches. There is a distinct mane upon the

neck, which, with its upright posture, combines to give the creature its supposed leonine appearance. The males are fierce in aspect, and if hard pressed will turn and show fight. Old animals bellow like bulls; the younger ones bleat like sheep. They bolt their fish without mastication. The female is only about half the dimensions of the male, and is considerably lighter in color. The animal is useful only for its hide, flesh, and fat.

THE WHALES (*Cetacea*)

Under the general name of Cetacea, *i. e.*, the Whales, are classed together a wonderful group of marine Mammalia, which includes not only the true whales, but also the Dolphin, Narwhal, Porpoise, and Grampus.

Notwithstanding their marked resemblance to fishes, the Cetacea possess the most indubitable mammalian character.

In the cetacea the bodies are elongated, fish-like, devoid of hair, and run out into a powerful caudal fin. The fore limbs are in the form of fins; there are no hind limbs. The cetacea are marine animals, and their food consists wholly of water animals and plants.

The whale is an astonishing animal, and in order that it may subsist a number of apparently contradictory conditions must be reconciled. It is a warm-blooded mammal, and yet spends its life wholly in cold water. In order to dive to great depths it must be able to make its body heavier than a corresponding bulk of water, and conversely at will make it lighter in order to reach the surface. Though breathing atmospheric air through nostrils, the animal can exist at a greater depth than where the pressure of the water would force its particles into solid oak, and yet no water can reach the wales' lungs. It must be able to exist without breathing at all for at least the space of an hour. With the bones, ears, and eyes of a mammal it has to move, hear, and see as though it were a fish.

The "spouting" or "blowing" of the whale is simply an operation of purifying its blood When the animal comes to the surface, it first expels the air in its lungs as it takes its first deep breath.

Dolphin (*Delphinus delphis*).—The dolphin is grey or greenish black on its upper parts, and white beneath. It generally attains a length of six feet, and lives in herds in all the northern seas. Hundreds of these swift animals are often seen around vessels, and amuse the passengers by their playful gambols. They feed chiefly on fish.

Greenland Whale (*Balæna mysticetus*).—This whale is greyish black on its upper parts, and white beneath. It is from forty-eight to seventy-two feet long, and weighs upwards of twenty thousand pounds. It is the largest of all living animals; a boat with six persons could enter its jaws. Its tongue is nine feet broad, eighteen feet long, and weighs about eight hundred pounds.

The whale inhabits the northern parts of the Atlantic and Pacific. It has been hunted for the sake of its blubber since the ninth century. A whale forty-eight feet long, and fourteen thousand pounds in weight, will furnish six thousand pounds of blubber, from which four thousand eight hundred pounds of oil will be obtained; there will also be over three thousand pounds of whalebone, which lies in the upper jaw in the place of teeth.

Narwhal, or **Sea Unicorn** (*Monodon monoceros*), allied to the dolphins and porpoises. The male has one—almost invariably the left—of the teeth or tusks in the upper jaw extraordinarliy developed into a spirally furrowed horn of pure ivory from six to ten feet long. This is the longest tooth found in the Mammalia. The adult animal is from ten to sixteen feet long. It has a grey back, mottled with black, the under parts being much lighter, but also spotted. It has a blunt, short head, no dorsal fin and very small flippers, but is very active and a rapid swimmer. It is peculiar to the Arctic Ocean, though it occasionally strays as far south as the British seas. The oil is valuable and the flesh edible. The ivory is very fine, and in the castle of Rosenborg at Copenhagen is a throne of the kings of Denmark made of this substance.

Porpoise (*Phocæna communis*).—The porpoise, five, six, or seven feet in length, is common in the North Atlantic. Often off the British coasts a shoal of porpoises may be seen frolicking quite near to the shore. Passengers on board ocean-going liners are always interested in watching the sportive "black pigs," as sailors call them, race along the side of the ship. The animals are captured chiefly for their oil, and the skin can be converted into useful leather.

Rorqual (*Balænoptera musculus*).—The common Rorqual is a typical species of the "finners," as sailors term them; the generic name means "Finned Whale," in reference to the small back fin that lies near the region of the tail. It attains an enormous size; one caught in the North Sea was ninety-five feet in length, twenty-two feet in width, and weighed over two hundred and fifty tons. Rorquals are the most widely distributed of all the larger Cetaceans; they are found nearly everywhere outside the Antarctic regions.

Whale Fisheries.—With the older method of whale-fishing the chief products were oil and whalebone. Recently the industry has been revolutionized, principally by Norwegians, and practically every part of the animal is used. For the new method a suitable island is selected, a cutting-up station constructed, and all whales killed are towed to the station and there drawn upon land to be dealt with. The modern whaling-vessel is a small and powerful steamer with a heavy harpoon gun mounted in the bows. The harpoon is a special kind of barbed spear. No boats are used, the steamer following the whales when sighted. By dealing with the carcase on shore all parts are now used, including the bone, blubber (or fat), the soft parts after the the oil has been expressed being prepared as fertilizers. The flesh is asserted to be palatable and may ultimately be sold for food.

WHITE AMERICAN EGRETS IN A SOUTH FLORIDA CYPRESS FOREST

These are perhaps the most beautiful of the heron family and are much persecuted by the plumage hunters for the sake of the spray-like plumes which grow on their backs in the breeding season.

THE BIRDS

THE BIRDS have a hard, bony skeleton, and red, warm blood; they breathe by means of lungs, and lay eggs with hard shells. Their bodies are covered with feathers, their fore limbs are changed into wings.

HOW BIRDS COMPARE WITH MAMMALS

In some ways birds are the highest of the vertebrate animals. They represent the climax of that passage from water to land which the backboned series illustrates. Their skeleton is more modified from the general type than that of mammals; their arrangements for locomotion, breathing, and nutrition are certainly not less perfect; their body temperature, higher than that of any other animals, is an index to the intense activity of their general life; their habitual and adaptive intelligence is familiarly great, while in range of emotion and sense impressions they must be allowed the palm. It is, in fact, only when we emphasize the development of the nervous system and the closeness of connection between mother and offspring, that the mammals are seen to have a right to their pre-eminence over birds.

THE VOICE OF BIRDS

With few exceptions, birds have a vocal organ, and are able to produce more or less variable sounds. The organ is, however, wanting in the running birds, such as the ostrich, and in the American vultures. The sounds produced are almost as varied as the different kinds of birds, and an expert has little difficulty in identifying a great number of forms by their distinctive noises. It is among the so-called perchers, songsters, or Insessores, that we find song really developed and that for the most part in the males, and in highest degree at breeding-time.

HOW BIRDS ARE CLOTHED

The *integument* differs markedly from that of other animals in being clad with feathers. Three distinct kinds of feathers are at once distinguishable—(*a*) the small hair-like downy rudimentary *filoplumes;* (*b*) the numerous smaller contour or covering *plumes;* and (*c*) the large strong quill-feathers or *pennæ* on wings and tail. The ordinary feather consists of a quill at the base of a shaft up the center, and of the vane borne on the sides of the shaft. The vane consists of parallel barbs, which are linked together by small barbules. On the bare legs of many birds the feathers are replaced by horny scales, and the horny structures forming the beak and terminating the toes are very familiar.

THE BIRDS OF PREY

The birds of prey have a hooked, curved beak, at the base of which are the nostrils, surrounded by cere skin. They live chiefly upon warm-blooded animals, which they seize with their claws and tear in pieces with their beak. There are more than five hundred varieties, which are separated into day and night birds of prey.

Eagles, falcons, hawks, harriers, buzzards, and the like are adapted for the pursuit of prey not only by possession of strong, hooked beaks, powerful talons, and keen powers of vision, but also by the swiftness of their flight. Many of them—for example, falcons—are able to poise themselves, apparently motionless, in the air till some such prey as a young rabbit or small bird is discovered, and then swoop down upon the victim with almost incredible rapidity.

Condor (*Sarcorhamphus condor*).—Largest of vultures, averaging nine feet wing expanse, lives among the peaks of the Andes but descends for food. Its feet are not adapted for grasping, and it cannot truly perch nor carry objects when flying; it sleeps soundly, can be lassoed at night and kills small quadrupeds, besides feeding on carrion. The condor lays two white eggs four inches long, on bare rock, hatched in seven weeks. The young are brown and a year old before they can fly. The male is black with white ruff, has wing bars and tip of bill; wattles are present on the head and breast. The female lacks comb, wattles, and has less white. The young do not acquire full plumage for six years. The condor depends more on sight than smell in finding food.

Eagle (*Aquila*) is a name given to many birds of prey in the Falcon family. The golden eagle, the white-headed eagle, and the sea-eagles are characteristic examples. The falcon family includes over three hundred predacious birds, feeding for the most part on living animals, hunting by day, and living usually on exposed rocky places. The bill is powerful, but rather short, high at the root, and slightly curved; the partition between the nostrils is complete; the upper margin of the eye-socket projects; the head and neck are feathered; the soles of the feet bear large callosities.

Representatives of this noble genus are found in all parts of the world except the neotropical and Australian regions.

The Golden Eagle is a large and magnificent bird. The predominant color is dark, tawny brown, but the back of the head and neck are more tawny and look golden in the sunlight. The young birds have tails of a brighter color. The adult female measures about three feet in length; the male is rather less both in length of body and wing. The golden eagles have their homes in remote rocky regions, but often wander far in search of booty. They prey upon numerous mammals and birds, but are rarely willing to run any great risks in so doing. The nest, usually upon a rocky ledge, is large and roughly made. There are most commonly two eggs. Though a strong and majestic bird, it cannot be credited with much bravery. The occasional cry is loud and shrill, but with some hoarseness. The species is widely distributed in Europe, Asia and North America.

The crested eagles are found in parts of both hemispheres, and are in some species distinguished by tufts of feathers on the back of the head. The harrier-eagle is an Old-World bird represented in Europe, north Africa, and western Asia. The fishing eagle or fish-hawk is an almost cosmopolitan bird, with markedly piscivorous diet. The bald eagle has the tarsus feathered only halfway to toes; with white head and tail after third year. Its length is about 36 inches. The bald eagle is the emblem of the United States, feeds on fish, sometimes secured by robbing the osprey and sometimes found as carrion.

Eagles as Emblems.—In the arms of the present German empire an eagle (with one head) sustains on its breast a shield containing the arms of Prussia. Austria has preserved the double-headed eagle of the earlier German empire. Russia assumed in 1472 the double-headed eagle under Ivan III. to signify that the czar sprang from the Greek emperors, who had borne it as a symbol since the partition of the Roman empire. A white crowned eagle in a red field was the shield of the kingdom of Poland. The arms adopted by the United States consist of a dark-brown eagle with outspread wings, having in one of its talons a bundle of arrows, in the other an olive branch, bearing on its breast a shield whose upper part is blue and under part silver, and crossed by six red vertical bars. In its beak it holds a band with the inscription *E. pluribus unum*, surmounted by thirteen stars, the original number of states.

Falcons (*Falco*) are birds of medium or small size, having short, strong beak, with a sharp hook at tip and a strong tooth on each side of upper mandible; legs short and strong, middle toe long, claws much curved and sharp, tail short and stiff, wings long and pointed. There are about fifty species, some known as hawks. True falcons, in hunting prey rise high in air above and swoop down. Hawks chase the prey near the ground. The most common falcon is dark-bluish above and white below with bars; the young are brownish above and streaked below. The largest falcon is found in the Scandinavian Mountains. Among small falcons are the sparrow-hawk of the United States and the kestrel of Europe. They feed on mice and insects. Most falcons prey upon birds, attacking some even larger than themselves. They, at one time, were trained for hunting the heron, sparrow, etc., in the sport known as falconry.

Hawks have the upper mandible not toothed, and the wings short, rounded, and concave below. They do not easily soar or glide.

Henhawks comprise chiefly the rough-legged hawk and the red-shouldered hawk. The first rarely, and the second never, takes chickens; they prey rather on noxious insects, mice, etc. The sharp-shinned hawk, length twelve inches, and Cooper's hawk, eighteen inches, are rufous on breast and dusky above, with dark bars on the tail. These useful buzzards last mentioned should be protected.

Goshawks (*Astur palumbarius*) is found in almost all parts of Europe. It generally inhabits thick woods in the neighborhood of

The ostrich is a strong runner and a swift racer. It has been known to equal the speed of a train going at the rate of sixty miles an hour. Though frequently used for driving, it is not easily managed.

fields and meadows, and builds its nest on the topmost boughs of a lofty tree.

This unsociable bird is as swift and wild as it is shy and cunning. It can be easily recognized at a distance by its long tail and short wings. When hunting for prey it flies, as a rule, along the edges of woods and thickets, and is active almost the whole of the day. Flying, resting, swimming, or running, it seizes its prey with equal dexterity. Its great swiftness and adroitness render the goshawk a formidable opponent. It appears suddenly among the unsuspecting birds, and, before they can escape, one lies bleeding under the claws of the bold robber. It follows its prey into inhabited houses, and sometimes flies through the windows.

The goshawk carries off poultry, and also steals game. It also destroys a great number of our most useful insect-devouring birds.

Sparrow Hawk (*Nisus communis*) resembles the goshawk both in form and habits, and is a true copy of its bigger cousin.

Osprey or Fishing Hawk (*Haliætus albicilla*) is often mistaken for the golden eagle. The latter, however, can be easily recognized by its feathered legs. The osprey is widely distributed in the United States along the Atlantic coast, and is found all over Europe. It has its nest on the summits of inaccessible rocks and cliffs along the coasts, or in the top of a high tree, and rarely among the reeds. The osprey is a lazy but obstinate and dangerous robber, attacking all animals which it is able to overcome. Like the bald eagle, it catches fish; but it also feeds upon carrion.

Owls (*Strigidæ*) include more than one hundred species, all of which belong to two families. The Java owl, which ranges from the eastern Himalayas to Burma, Ceylon, Java and Borneo in itself constitutes the second of these families. They have large eyes, looking forward, encircled by stiff feathers, and with vertical pupil. Most are nocturnal and see poorly by day, but the Hawk Owl, and Snowy Owl of arctic regions, feed by day. Their food consists of rodents, insects, birds, vermin, and fish. The Great Horned Owl (*Bubo virginianus*) attains a weight of eight pounds, and attacks poultry. Owls hear well; some have a well developed feathered external ear. The long ears by which the horned owl is known, refers to the horns of feathers, developed above the eyes. Owls fly noiselessly, owing to their soft plumage. The feet are usually feathered the outer toe is reversible, and in the Fishing Owl the toes are osprey-like. The female is the larger. The size ranges from six inches in the Pygmy Owl of the tropical forests, to thirty inches in the Great Grey Owl of the northern regions. Reddish brown is predominant, but dark and light colors

The Peacock excels all other birds in the beauty of its plumage, the colors of which are usually both gorgeous and varied. The above bird is pure white, and very rarely seen in the United States.

may be exhibited by a single brood. The eggs are spherical and pure white. Some species breed before the snow has gone, and their eggs hatch a few at a time. The Snowy Little Owl of Europe, is the symbol of learning. The Burrowing Owl lives in the burrows of prairie dogs in America, on whose young it feeds, in part while rattle-snakes associate with both as a common enemy.

The **White** or Barn Owl (*Strix flammea*) always lives in the neighborhood of man, building its nest in sheds, church-towers, old ruins, and also in pigeon-houses. It sleeps during the day. At night it flies through the gardens and fields, catching all kinds of mice, insects, and young birds. The nest is carelessly built, and in the spring contains from six to nine white, oval eggs.

Vultures (*Vulturinæ*) are large carrion-eating birds of prey. Those of the Old World differ from those in the New in several particulars; thus, the hind toe of the former is on the level with the other toes; the partition between the nostrils is not perforated as in American vultures; and they carry food to their young in their claws and not in their beaks. The chief of the American vultures are the Condor, Turkey Buzzard, Carrion-crow, or Black Vulture, and the King Vulture, which haunts jungles from Mexico to Paraguay, and is white, with the long tail and wing-feathers black, the head lemon and scarlet. Examples of the Old World vultures are the Bearded Vulture or Lammergeyer (*Gypaetus barbatus*), the largest bird of prey of Europe. It was formerly often seen in the Alps and Pyrenees; but is now, at least in the Swiss and Bavarian Alps, almost exterminated. It is a bold and dangerous robber, not only waylaying hares and roes, but also sheep and chamois; children even, have been attacked by this bird.

The Egyptian or White Vultures are known as Pharaoh's Chickens. The crested Black Vulture ranges from China through North Africa. It builds large nests in trees on mountain-tops, where it rears a single young. The Griffon is black, with white tail and wing feathers. Vultures find their food by sight.

THE CLIMBING BIRDS

The toes of the climbing birds are arranged opposite each other in pairs; one of the back toes is, in many of these birds, so flexible that it can be easily turned forward. The claws are long, strong, and hooked, thus these birds can easily hold on firmly, even in a perpendicular position. Most of them frequent the woods, and live upon insects and fruit.

Cuckoo (*Caculus canorus*) is as large as a pigeon. It has a gently-curved, deeply-cleft beak, long,

pointed wings, and wedge-shaped, pointed tail. The outer toe can be directed forward as well as backward. American cuckoos hatch their own eggs. The Old World cuckoos are especially marked by the habit of leaving their eggs to be hatched by other birds. The spotted cuckoo of northern Europe lays four eggs in a nest, usually that of a crow. A small South African cuckoo, size of a sparrow is brilliantly colored. Australia has the large channel billed cuckoo, with its immense beak.

The road-runner or chapparal cock of the desert plateaus of western United States feeds mainly on grasshoppers. In the West Indies and adjacent states is found the Ani, with high bill, and peculiar in that several females unite in building one nest, where all co-operate in hatching their eggs.

The cuckoo, with its never-wearied song, is the joyful harbinger of spring, and is heard with delight by old and young. It lives chiefly upon hairy caterpillars; and, as it is always feeding, we can justly include the cuckoo among the useful birds.

Parrots (*Psittaci*) are near relatives of the cockatoos, paroquets, macaws, lories, nestors, etc. The true parrots have the upper mandible toothed, and longer than high, and a short, rounded tail. These birds combine with the beauty of their plumage a nature of great docility, and have the faculty of imitating the human voice in a degree not possessed by other birds. They are found chiefly in Africa, from whence we get the gray parrot, the best talker. South America, which is particularly rich in species, furnishes the well-known green parrot; and North America is the home of a single species, the Carolina parrot. The parrots are forest birds, and are adepts at climbing, using for that purpose both the feet and the bill. Their food consists of seeds and fruits. They make their nests in holes, and lay white eggs, as is commonly the case where the eggs are concealed.

The parrots may be called the monkeys among the birds; for, like the monkeys, they seek their food while climbing, but are awkward and clumsy when on the ground. Their imitative qualities and docility, their obstinacy and slyness, and their disagreeable voice and gregarious habits, all serve to remind us of the monkeys.

Toucan (*Rhamphastus toco*), a bird of the American tropics, is related to the woodpeckers and parrots. It belongs to the most curious of the animal forms, as its immense beak is treble the length of its head. The tongue is horny, slender, and brush-like; the considerable tail is hinged next the pelvis, so that it can be thrown over the back when resting and where the bill lies also during sleep. Toucans are omnivorous, but prefer fruit, live in flocks in forests, and nest in hollow trees. There are over fifty species, in size from that of a robin to a crow, and colored from green to black, variegated with red, yellow and white. The largest is two feet long, with bill eight inches long and three inches high.

Woodpecker (*Picidæ*) includes any of three hundred birds which have climbing feet, stiff tail feathers and which bore into trees for grubs on which they feed, though some of them are fond of fruit and other vegetable food. Most of the species have barbed and pointed tongues with which they spear the larvæ, but in some the tongue is smeared with a sticky substance, secreted by glands in the throat. There are no woodpeckers in Australia or Madagascar, but they occur in all other parts of the world. The prevailing color of the plumage is green—dark olive on the upper, pale green on the under parts; the crown and back of the head are bright crimson.

Of the numerous American species the flickers, the South American ground-flickers, which live chiefly on termites, and the great ivory-billed woodpecker may be specially noted. The last-named species, which inhabits the dense forests of the southern States, is one of the handsomest of the group, and was once called the prince of woodpeckers.

The woodpeckers lead a solitary life. Their presence is generally known by the noise they make while pecking; holding fast to a tree, they hack at it with their long, sharp beaks, so that splinters and chips fly in all directions. The woodpecker excavates a hole in the rotten tree, in order therein to build its nest.

THE SINGING BIRDS

Not all the birds belonging to this class are veritable songsters; but nearly all of them have in the throat an organ of song, consisting of five or six pairs of muscles, by means of which they can produce a variety of notes. They are mostly small, prettily colored birds, which chiefly inhabit the Temperate Zones, and make themselves very useful by devouring the insects, worms, and seeds of weeds in the fields, gardens, and woods. They delight us with their song; but their song is also the reason why some of them are kept in captivity.

Birds of Paradise (*Paradisea apoda*), though song birds of some ability, are more particularly notable for their gorgeous plumage. They are natives of New Guinea and Australia, and are very closely allied to the crow family, both in their habits and voice. The Great Bird of Paradise is the largest of the species, measuring about one and one-half feet in length; the others are comparatively small. The adult males are in beauty unsurpassed even by humming-birds. Tufts of bright feathers spring from beneath the wings, from the tail, or from the head, back, or shoulders. Trains, fans, and exquisitely delicate tress-like decorations occur abundantly, and the gracefulness of the plumage is enhanced by the brilliant color and metallic luster. The females are plain, sober-colored birds, and it is only with maturity that the males acquire that brilliancy of plumage which they exhibit to such advantage in their courtships. The true birds of paradise feed on fruits and insects, and are practically omnivorous. Their mode of life is more or less gregarious. Their song consists of a series of loud, shrill notes.

Blackbird (*Turdus merula*), is a member of the thrush family. The plumage of the male is quite black, and the beak yellow; the female is dark brown above, and greyish brown on the under parts, with a brown beak. It is shy, solitary, nests in March, and has two broods during the season. The nest is plas-

tered inside with mud; four or six blue eggs, speckled with black, are laid. The bird feeds mainly on insects. It is a mocking bird, but not so good a songster as the song-thrush. It is found in Europe and North Africa.

The American Crow-blackbird, (a different family) is restricted to the region east of the Rockies, the Blue-headed Grackle is confined west of the Mississippi, while the Rusty Grackle pervades the whole continent.

The Red-winged Blackbird breeds in Mexico and North America south of the Barron Grounds; winters in southern half of United States and south to Costa Rica.

The blackbird is frequently an inhabitant of the woods; but in the winter it comes into the gardens of the villages and towns. It is very fond of fruit, and thus often ravages the orchards and strawberry gardens.

Bobolink (*Dolichonyx oryzivorus*), resembles a sparrow, but its tail feathers are acute. Length seven inches. It breeds from Ohio northeast to Nova Scotia, north to Manitoba, and northwest to British Columbia; winters in South America.

Few species show such striking contrasts in the color of the sexes, and few have songs more unique and whimsical. In its northern home the bird is loved for its beauty and its rich melody; in the South it earns deserved hatred by its destructiveness. Bobolinks reach the southeastern coast of the United States the last half of April just as rice is sprouting and at once begin to pull up and devour the sprouting kernels. Soon they move on to their northern breeding grounds, where they feed upon insects, weed seeds, and a little grain. When the young are well on the wing, they gather in flocks with the parent birds and gradually move southward, being then generally known as reed birds. They reach the rice fields of the Carolinas about August 20, when the rice is in the milk. Then until the birds depart for South America planters and birds fight for the crop, and in spite of constant watchfulness and innumerable devices for scaring the birds a loss of ten per cent of the rice is the usual result.

Canary (*Fringilla*), a beautiful but very common cage-bird. much esteemed for its musical powers, was introduced into Europe from the Canary Islands. Its color is grayish brown and dusky green, but the numerous artificial breeds show varieties of yellow and black markings, crests, etc. Naturally monogamous, the male sings best to win the love of the female. She incubates the eggs, he feeds the young. Six eggs are produced four times a year. Canaries cross readily with allied species. They have been domesticated for nearly four centuries.

Distinct varieties have been produced by scientific selective breeding, and these reproduce their distinctive characteristics, and "like breeds like" so long as the varieties are not crossed. The hardiest are the Norwich; the largest are Lancashire Coppies; the most costly and delicate are Belgians. Lizards, London Fancies, Yorkshires, Scotch Fancies, and Cinnamons practically complete the list.

Catbird (*Mimus Carolinensis*) is a species of Thrush common in eastern United States, so called from its peculiar note. It is very dark colored, about nine inches long, and nests in low bushes early in May. It breeds throughout the United States west to New Mexico, Utah, Oregon and Washington, and in southern Canada; winters from the Gulf States to Panama. The bird has a fine song, unfortunately marred by occasional cat calls. With habits similar to those of the mocking bird and a song almost as varied, the catbird has never secured a similar place in popular favor. Half of its food consists of fruit, and the cultivated crops most often injured are cherries, strawberries, raspberries, and blackberries. Beetles, ants, crickets, and grasshoppers are the most important element of its animal food. The bird is known to attack a few pests, as cutworms, leaf beetles, clover-root curculio, and the periodical cicada, but the good it does in this way probably does not pay for the fruit it steals.

Chickadee (*Penthestes atricapillus*).—The Chickadees are among the most popular birds that we have, owing to their uniform good nature even in the coldest weather, and their confiding disposition. They are common about farms and even on the outskirts of large cities they will come to feasts prepared for them on the window sill with their clear "phe-be," "chick-a-dee-dee-dee" or "dee-dee-dee," and several scolding or chuckling notes. They nest in hollow stumps at any elevation from the ground but usually near the ground, and most often in birch stubs. Their eggs are white, sparingly speckled with reddish brown. They range and breed in the northern half of the United States and northward. The Carolina Chickadee (*Parus carolinensis*) is smaller and with no white edges to the wing feathers, and is found in southeastern United States, breeding north to Virginia and Ohio.

Crossbills (*Loxia*) are the most highly developed members of the Finch family, characterized by having the tips of the upper and lower bills crossing so as to facilitate extraction of seeds. Males are reddish, females brownish olive in general coloration. The crossbill lives chiefly in the pine plantations, where it feeds for the most part on the seeds of the pine, cleverly opening the cones with its pointed beak. It hatches in all seasons of the year.

Finch (*Fringilla*) is a name applied to many birds but generally used with some affix, as in the familiar names bullfinch, chaffinch, and goldfinch. A finch is usually small, has a hard, conical beak, and generally lives upon seeds. The distribution is almost world-wide, excepting Australia. The buntings and the weaver-finches of the Ethiopian and Australian regions are usually kept distinct.

Some, as Canary (see Canary) and Bullfinch make fine songsters in confinement. The Chaffinch is the typical Finch of Europe. In America the Purple Finch has a flush of red in male; the female is olive brown, streaked below, the tail feathers soft and rounded; length without tail, three and one-half inches. The Goldfinch has acute bill, yellow on bases and edges of quills, male rich yellow, length three inches without tail; also called Thistle-bird and Yellow-bird. The Lark-finch of the prairies has tail three inches long, and is much streaked

with black, white, and chestnut. In the spring the males are usually seen on, or heard from, tree tops in orchards or parks, giving forth their glad carols. They are especially musical in spring when the snow is just leaving the ground and the air is bracing.

The nest consists of strips of bark, twigs, rootlets and grasses, placed at any height in evergreens or orchard trees. The eggs resemble, somewhat, large specimens of those of the Chipping Sparrow. They are three or four in number and are greenish blue with strong blackish specks.

Grosbeaks are finches with beaks extraordinarily stout, forming a continuous curve with the top of the head. The Cardinal Grosbeak is known as the Winter Redbird. In eastern United States are also the Blue, Rose-breasted, and Pine Grosbeaks, all beautifully colored and fine singers. The Rose-breasted Grosbeak breeds from Kansas, Ohio, Georgia (mountains), and New Jersey, north to southern Canada; winters from Mexico to South America. This beautiful grosbeak is noted for its clear, melodious notes, which are poured forth in generous measure. The rosebreast sings even at midday during summer, when the intense heat has silenced almost every other songster. Its beautiful plumage and sweet song are not its sole claim on our favor, for few birds are more beneficial to agriculture. The rosebreast eats some green peas and does some damage to fruit. But this mischief is much more than balanced by the destruction of insect pests. The bird is so fond of the Colorado potato beetle that it has earned the name of "potato-bug bird." It vigorously attacks cucumber beetles, many of the scale insects, spring and fall cankerworms, orchard and forest tent caterpillars, tussock, gipsy, and brown-tail moths, plum curculio, army worm, and chinch bug. In fact, not one of our birds has a better record.

Jays (*Cyanocitta*) are brightly colored, noisy birds, near relatives of the crow and are represented by numerous species distributed throughout the northern hemisphere. Probably the best known is the Blue Jay, one of the most beautiful birds that we have, but, unfortunately, one with a very bad reputation. Blue Jays often rob other birds of their eggs and young as well as food and nesting material. They are very active birds and are always engaged in gathering food, usually acorns or other nuts, and hiding them away for future use.

These Green Jays are very beautiful, but, like all the other members of the family, they are merciless in their treatment of smaller birds. During the summer their diet consists of raw eggs with young birds "on the side," or vice versa; later they live upon nuts, berries, insects; in fact, anything that is edible.

They are fairly common in the Lower Rio Grande Valley in southern Texas.

Lark (*Alauda arvensis*).—This familiar songster, is well known as the symbol of poets and the victim of epicures. It is included among a type of birds which comprizes over one hundred species, widely distributed in Europe, Asia, Africa, with spreading stragglers in Australia and North America. The plumage is usually sandy brown, the color of the ground; the lower legs bear scales, behind and before; the hind claw is very long and straight; the bill is strong and conical. The skylark measures about seven inches in length; the males and females are alike in plumage; the food consists of insects, worms, and seeds. It nests in April, making a structure of dry grass in a hollow in the ground, usually among growing grass or cereals. The eggs (three to five) are dull gray, mottled with olive brown; two broods are usually reared in the season.

The Meadowlarks (*Sturnella magna*) our familiar friends of the hillside and meadow; their clear, fife-like whistle is often heard, while they are perched on a fence-post or tree-top, as well as their sputtering alarm note when they fly up before us as we cross the field. In North America they range east of the Plains and north to southern Canada; and winter from Massachusetts and Illinois southward.

The Western Meadowlark has the yellow on the throat extended on the sides; its song is much more brilliant and varied than the eastern bird. It is found from the Plains to the Pacific. The Florida Meadowlark is smaller and darker than the common Horned Lark (*Otocoris alpestris*). This variety is only found in the United States in winter. During the mating season they have a sweet song that is uttered on the wing, like that of the Bobolink.

Mockingbird (*Mimus polyglottos*). This is the great vocalist of the South, and by many is considered to be the most versatile singer in America. It is found in gardens, pastures and open woods. All its habits are similar to our Catbird, and like that species, it is given to imitating the notes of other birds. Its song is an indescribable medley, sometimes very sweet and pleasing, at others, harsh and unmusical. Its general colors are gray and white.

Usually the nest is built in impenetrable thickets or hedges, or again in more open situation in the garden; made of twigs and rootlets, lined with black rootlets; the four or five eggs are bluish green with blotches of reddish brown.

It ranges throughout the southern United States, breeding north to New Jersey (and casually farther) and Ohio; and winters in the South Atlantic and Gulf States. The Western Mockingbird is found in southwestern United States, north to Oklahoma and California.

Nightingale (*Daulias luscinia*).—The common nightingale is well known as the finest of songsters. It is rather larger than the hedge-sparrow, with about the same proportionate length of wings and tail. It is of a rich russet-brown color above, shading into reddish chestnut on the tail-coverts and tail; the lower part grayish-white; bill, legs, and feet brown. The sexes are alike in plumage. It is a native of many parts of Europe and Asia, and of the north of Africa, and is a bird of passage, extending its summer migrations on the continent of Europe as far north as Sweden. It frequents thickets and hedges and damp meadows near streams, and feeds very much on worms, beetles, insects, ant's eggs, caterpillars, and other insect larvæ. The male

bird sings by day as well as by night, but at night its song is most noticeable and characteristic. The variety, loudness and richness of its notes are equally extraordinary; and its long, quivering strains are full of plaintiveness as well as of passionate ecstasy. The ancient Romans paid more for a nightingale than they paid for a slave.

Orioles (*Oriolidæ*) are confined entirely to the Old World and are characteristic of the Oriental and Ethiopian regions. The birds called "Orioles" in the United States belong to an entirely different family, the *Icteridae*. The members of the family are generally of a bright yellow or golden color, which is well set off by the black of the wings.

Twenty-four species are enumerated, the best known being the GOLDEN ORIOLE. The adult male is about nine inches long. Its general color is a rich, golden yellow; the bill is dull orange-red; a black streak reaches from its base to the eye; the iris is blood-red; the wings are black, marked here and there with yellow, and a patch of yellow forms a conspicuous wing-spot; the two middle feathers of the tail are black, inclining to olive at the base, the very tips yellow, the base half of the others black, the other half yellow; legs, feet and claws dark brown. The female is less yellow than the male, and the under parts are streaked with gray. In central and southern Europe it is common in summer in certain localities; it is abundant in Persia, and ranges through central Asia as far as to Irkutsk. It winters in South Africa. Its food consists of insects and their larvæ, especially green caterpillars, and fruits such as currants, cherries and mulberries. The song of the male is short, loud, clear, and flutelike; he has also a mewing call-note, and a harsh alarm-note. The nest is unlike that of any other European bird; it is placed in, and suspended from, a fork in a horizontal branch, sometimes of an oak, usually of a pine, in a shady grove or thick wood, and is made of bark, wool and grass.

The BALTIMORE ORIOLES (*Icterus galbula*) range in color through orange, black, yellow and gray. They are sociable birds and seem to like the company of mankind, for their nests are, from choice, built as near as possible to houses, often being where they can be reached from windows. As they use a great deal of string in the construction of their nests, children often get amusement by placing bright-colored pieces of yarn where the birds will get them, and watch them weave them into their homes. Their song is a clear, querulous, varied whistle or warble; the call, a plaintive whistle. The Baltimore Oriole is found east of the Rockies, breeding north to New Brunswick and Manitoba. They winter in Central America.

Robin (*Planesticus migratorius*).—These well-known birds are very abundant in the northern half of the United States, being found most commonly about farms and dwellings in the country, and also in cities if they are not persecuted too severely by English Sparrows.

The male has a black head and bright reddish brown breast; the female, a gray head and much paler breast; the young, intermediate between the two and with a reddish brown breast spotted with black.

The song of the Robin is a loud, cheery carol, "cheerily-cheerup, cheerily-cheerup," often long continued. The nest is a coarse but substantial structure of mud and grass, placed on horizontal boughs or in forks at any height, or in any odd place about dwellings; the four or five eggs are bluish green. Robins range throughout eastern North America, breeding from the middle of the United States northward. They winter throughout the same region. The Southern Robin is a paler form found in the Carolinas and Georgia.

Sparrows (*Fringillidæ*) are small plain-colored birds, with narrow palates, small conical bills, and streaked plumage. The English Sparrow (*Passer domesticus*) was introduced into United States in 1853, and has since spread to a remarkable extent, in cities, driving off other birds. The white-throated sparrow, an American form, is really a bunting. Other American sparrows have little in common with the English Sparrow. All American sparrows wear the characteristic brown streaked plumage of the group, and include the small chestnut-capped chipping sparrow of gardens, the song sparrow, the little active seashore sparrow, and the large handsome fox sparrow.

SONG SPARROW (*Melospiza melodia*).—This is probably the best known, most abundant and most widely distributed of all our birds. They are quite hardy and many of them winter in the northern states, but the majority go farther south, returning to their summer homes about the first of March. They may be found anywhere where there are bushes, vines or hedges, and very often about houses, even in large cities.

Their song is very pleasing and musical, strongly resembling brilliant measures from that of the Canary.

The nest of grass is either on the ground or in bushes, and contains three to five bluish-white eggs, profusely spotted with brown. The Song Sparrow breeds from Virginia and Missouri north to southern Canada. It winters from Massachusetts and Ohio southward. Many local races are found west of the Rockies, but only one east of them. Dakota Song Sparrow is found in the vicinity of Turtle Mountains, North Dakota; it is lighter above and brighter below.

Swallows (*Hirundinidae*) are birds with long pointed wings, small feet, short, broad bill, and ten tail feathers. About one hundred species are known, almost universal in distribution. They feed while flying, catching insects. Some build nests in crevices, some dig holes in banks, and others make mud nests plastered against walls. The Barn Swallow of the United States, much like that of Europe, is lustrous steel blue, pale chestnut below, tail deeply forked. It arrives early in May and remains until late August. The American Chimney Swallow is a Swift. The Purple Swallow, or Purple Martin is a North American species. The general color, both of the upper and under parts, is shining purplish blue; the wings and tail black. It is a universal favorite and is hailed as the harbinger

of spring. The Republican Swallow or Cliff-swallow of North America, makes a nest of mud, in form somewhat like a Florence flask, which it attaches to a rock or to the wall of a house. Hundreds sometimes build their nests in close proximity.

Thrasher (*Toxostoma rufum*) an American mimic bird or mocking thrush, is common in the eastern United States, mainly rust red above and whitish below, the breast and sides marked with lines of elongated brown spots. It is called also the Brown, Red, or Ferruginous Thrush, the Corn-planter, and French or Sandy Mockingbird. The song of this Thrasher is most musical and pleasing. It has a similarity to that of the Catbird, but is rounder, fuller and has none of the grating qualities of the song of that species. They apparently have a song of their own and do not deign to copy that of others. They are one of the most useful and desirable birds that we have. The Sage Thrasher (*Oroscoptes montanus*) is often known as the Mountain Mockingbird because of the brilliance of its song, a very varied performance, long continued and mocking that of many other species. They inhabit sage-brush regions and are partial to the lower portions of the country, although frequently met in open mountains. They are not shy and can readily be located by their voices.

They nest in bushes, especially the sage and cactus, and range through the sage-brush regions of western United States from the Plains to the Pacific.

Thrush (*Turdus*), belongs to a family including many of the most familiar song-birds of Europe and America. The best-known American Thrush is the Robin. (See Robin). The Wood-thrush has a most melodious evening song, and is nearly as large as the Robin; the Hermit Thrush, has an even more exquisite song, which, owing to the habits of the bird is less frequently heard; Wilson's Tawny Thrush has a strange, bell-like song. Other American thrushes include the Olive-backed and the Gray-cheeked varieties. The largest known British species is the Missel Thrush, sometimes called the "Stormcock," from its habit of singing before or during wind or rain.

The Song Thrush (*Turdus musicus*) is smaller in size, and possesses finer powers of song. It is olive grey on the upper parts, while the under parts are a lighter grey, with dark fleckings. It is a true inhabitant of the woods, and comes to us early in March, animating nature, then just waking, with its musical song. The Song Thrush lives upon insects, and also upon snails, which it strikes upon a stone in order to break their shells.

Warblers (*Mniotiltidæ*).—Numerous species of warblers are found in North America which appear to graduate into the Tanagers. They are birds of brighter plumage than the Old-World Warblers, but resemble them in their habits, and are also migrants. The Blackburnian Warbler (*Dendroica fusca*) is the most exquisite of the whole family; it is the most eagerly sought bird by bird lovers, in the spring. Some years they are very abundant, while in others few are seen, their routes of migration evidently varying. They arrive about the time that apple trees are in bloom, and are frequently seen among the blossoms, dashing after insects. Their song, a high-pitched lisping "zwe-zwe-zwe-see-ee-ee," ending in a thin, wiry tone, almost a hiss, is very distinct from the song of any other bird. They nest in coniferous trees at any height from the ground. Shreds of bark, fine cedar twigs, rootlets, etc., are used in constructing nests. The Magnolia Warbler (*Dendroica magnolia*) is one of the prettiest of the Warblers and one of the least timid. Birch woods are their favorites during migrations, although a few of them will be found almost anywhere. They utter a short, rapid warble.

Wrens (*Troglodytes*) have a slender, slightly curved and pointed bill; the wings are very short and rounded; the tail short, and carried erect; the legs slender, and rather long. Their plumage is generally dull. Some fifteen species are recognized in North America, of which the most familiar and widely distributed is the House-Wren (*Troglodytes ædon*). These are bold, sociable and confiding birds, seemingly to prefer men's society, building their nests in bird boxes that are erected for them, or in the most unexpected situations about buildings. They are one of the most beneficial birds that can be attracted to one's yard, feeding wholly upon insects. Their songs are loud, clear and bubbling over with enthusiasm.

Wrens breed north to Maine and Manitoba and winter along the Gulf Coast. The Western House Wren is found from the Plains to the Pacific coast ranges.

THE WADING BIRDS (*Struthiones*)

In this class of birds, the beak is generally slender, the legs long and stilt-like. The strutiones live in marshy spots, and on the banks of rivers. They feed upon the reptiles and insects found in water and marshy districts, and upon plants. Most of the wading birds are migratory.

Adjutant (*Leptoptilus argala*), is a bird, common during summer in India. Generally stork-like in appearance, it stands about five feet high, and measures fourteen or fifteen feet from tip to tip of extended wings. The four-sided pointed bill is very large; the head and neck are almost bare; and a sausage-like pouch, sometimes sixteen inches long, and apparently connected with respiration, hangs down from the base of the neck. While feeding largely on carcases and offal about the towns, it also fishes for living food, and sometimes devours birds and small mammals. The loose under-tail feathers are sometimes used for decorative purposes.

Bittern (*Botaurus*).—The American species makes a rude nest of sticks, reeds, etc., in its marshy haunts, and lays four or five greenish-brown eggs. The bird is sluggish, and its flight is neither swift not long sustained. When assailed, it fights desperately with bill and claws; and it is dangerous to approach it incautiously when wounded, as it strikes with its long sharp bill, if possible, at the eye. It is common in many parts of North America, migrating according to the season. The crown of the head is reddish brown, and the colors and markings of the plumage differ

considerably from those of the common bittern.

Crane (*Grallatores cinerea*).—This family of birds differs from herons, storks, etc., in having the hind-toe placed higher on the leg than the front ones, and in certain characters of bill and skull. The members are also less addicted to marshy places, and feed not only on animal, but, to a considerable extent, on vegetable food. The cranes are all large birds, long-legged, long-necked, long-billed, and of powerful wing. Some of them perform great migrations, and fly at a great height in the air. The young cranes are helpless and require to be fed. Only two eggs are laid. The crane, when standing, is about four feet in height; the prevailing color is ash-gray; the head bears bristly feathers, and has a naked crown, reddish in the male; the bill, which is longer than the head, is reddish at the root, dark green at the apex; the feet are blackish; the tail is short and straight. They are very stately birds, though their habit of bowing and dancing is often grotesque. They feed on roots, seeds, etc., as well as on worms, insects, reptiles and even some of the smallest quadrupeds. The flesh is must esteemed.

The Whooping Crane (*G. americana*) is considerably larger than the common crane, which it otherwise much resembles except in color; its plumage, in its adult state, is pure white, the tips of the wings black. It spends the winter in the southern parts of North America. In summer it migrates far north.

Heron (*Ardea*) a large bird covered with long, loose down, with large wings, and a hard horny bill longer than the head, compressed from side to side, and united to the skull by firm, broad bones.

In the Heron genus—which includes the species commonly known as Egrets—the plumage is beautiful, but seldom exhibits very gay colors; white, brown, black, and slate, finely blended, generally predominating. The body is small in proportion to the length of the neck and the limbs. Herons are very voracious, feeding mostly on fish and other aquatic animals; but they also often prey on snakes, frogs, rats, and mice, and the young of other birds.

The Common Heron (*Ardea cinerea*) measures about three feet from the point of the bill to the tip of the tail. It is of a delicate gray color on the upper parts, the quill-feathers are black, the tail of a deep slate color, and the long plume is glossy dark. It generally builds its nest on a high tree; and as many as eighty nests have been counted on a single oak. America has many species of herons, most numerous in its warmer parts.

A common species of the temperate parts is the green heron (*A. virescens*), whose flesh is much esteemed. Other important species are the Great Blue Heron (*A. herodias*), the Great White or Florida Heron (*A. occidentalis*), the Great White Egret (*A. egretta*), and the Little White Egret (*A. candidissima*).

The Peacock Heron (*A. helias*) of South America, a small heron of exquisitely graceful shape and mien, with plumage variegated with colored spots and bars, is a favorite pet bird of the Brazilians.

Ibis (*Ibidoideæ*).—These birds are related to the spoonbills, and, more remotely, to the storks and herons. The bill is long, slender, curved, thick at the base, the point rather obtuse, the upper mandible deeply grooved throughout its length. The face and generally the greater part of the head, and sometimes even the neck, are destitute of feathers, at least in adult birds. The plumage is mainly white, with black feathers and plumes on the wings. The neck is long. The legs are rather long, naked above the joint, with three partially united toes in front, and one behind; the wings are moderately long; the tail is very short.

The Sacred or Egyptian Ibis, is an African bird, two feet six inches in length, although the body is little larger than that of a common fowl. The ancient Egyptians worshiped it as the emblem of purity, and used to embalm it.

The Glossy Ibis is a smaller species, also African, but migrating northward into continental Europe, and occasionally seen in Britain. It is also a North American bird. Its habits resemble those of the Sacred Ibis. Its color is black, varied with reddish brown, and exhibiting fine purple and green reflections. It has no loose pendent feathers.

The White Ibis, a species with pure white plumage, once abounded on the coasts of Florida, but has been killed off by feather hunters, so that it is rare except in the remote tropics.

The Scarlet Ibis is a tropical American species, remarkable for its brilliant plumage, which is scarlet, with a few patches of glossy black.

The Straw-necked Ibis is a large Australian bird of fine plumage, remarkable for stiff, naked, yellow feather-shafts on the neck and throat.

Plovers.—Wading shore birds sometimes also known as Sandpipers. Their bills are long for probing in the mud. The wings are long and pointed. The most peculiar species lives in New Zealand: its bill is sharply bent either to the right or left, near the end, enabling it to secure food from beneath stones.

North America has a number of species of plovers, such as the Kildeer Plover, abundant on the great western prairies, and not unfrequent in the Atlantic states. It utters, when approached by man, a querulous or plaintive cry.

Upland Plover (*Bartramia longicauda*) is the only plainly colored shorebird which occurs east of the plains and inhabits exclusively dry fields and hillsides. It breeds from Oregon, Utah, Oklahoma, Indiana, and Virginia, north to Alaska; winters in South America. It is the most terrestrial of our waders, is shy and wary, but has the one weakness of not fearing men on horseback or in a vehicle. Since the bird is highly prized as a table delicacy, it has been hunted to the verge of extermination. Ninety-seven per cent of the food of this species consists of animal forms, chiefly of injurious and neutral species. It injures no crop, but consumes a host of the worst enemies of agriculture.

Stork (*Ciçonia alba*).—The storks are usually divided into the True Storks and the Ameri-

can "Wood Ibises" (*Tantalus*). There are about a dozen species. They belong chiefly to the Old World. The most familiar representative of the family is the Common Stork or White Stork (*Ciconia alba*), a native of the greater part of the Old World, a migratory bird, its range extending even to the northern parts of Scandinavia. It is about three and one-half feet in length. The head, neck, and whole body are pure white; the wings partly black; the bill and legs red. The neck is long, and generally carried in an arched form; the feathers of the breast are long and pendulous, and the bird often has its bill half hidden among them. The flight is very powerful and high in the air; the gait slow and measured. In flight the head is thrown back and the legs extended. The stork sleeps standing on one leg, with the neck folded, and the head turned backward on the shoulder. It frequents marshy places, feeding on eels and other fishes, frogs, lizards, snakes, slugs, young birds, small mammals, and insects. It makes a rude nest of sticks, reeds, etc., on the tops of tall trees, or of ruins, spires, or houses. There are four or five eggs, white tinged with buff; and the old nest is re-occupied next year.

Woodcock (*Scolopax*).—Their nest is formed simply by lining a sheltered hollow with dead leaves, and three or four yellowish eggs with brown markings are laid in March or early in April. The young birds are sometimes carried by the mother from place to place, and the manner of carrying has given rise to much discussion. The woodcock feeds in the early morning and at dusk on worms, beetles, small crustaceans, etc., the quantity of food consumed being very large. The adult bird measures about fourteen inches, and weighs less than one pound.

The American Woodcock (*S. minor*) is a smaller bird than the European species, and it also is in much request for table use. It is eleven inches in length, and is found east of the Mississippi and south of the Canadian forests.

THE SWIMMING BIRDS (*Natatores*)

The beak is of a medium length; the front toes are, as a rule, joined together by a membrane, to aid the birds in swimming. The natatores live upon all still and flowing bodies of water, and feed upon the water reptiles and insects, rarely upon the water plants; and they are esteemed for their flesh, eggs, and feathers.

Albatross (*Diomedea*).—The Common or Wandering Albatross (*D. exulans*) is the largest of web-footed birds, measuring four feet in length, and from ten up to as much as seventeen feet in spread of wings. It weighs fifteen to twenty pounds, or even more. The wings are, however, narrow in proportion to their length. It often approaches very near to vessels, and is one of the objects of interest which present themselves to voyagers far away from land, particularly when it is seen sweeping the surface of the ocean in pursuit of fish and garbage. It seems rather to float and glide in the air, than to fly like other birds, for, except when it is rising from the water, the motion of its long wings is scarcely perceptible. It is affirmed by some to sail by setting its wings like sails, and to make headway against the wind without flapping. The albatross has great powers of sustained flight. It often follows a ship for a considerable time, and it has been calculated that it may fly seven hundred and twenty nautical miles in a day.

The plumage is soft and abundant, mostly white, dusky on the upper parts, with some of the feathers of the back and wings black. The bill is of a delicate pink, inclining to yellow at the tip.

The albatross is extremely voracious; it feeds on fish, cuttle-fish, jelly-fish, etc., but has no objection to the flesh of a dead whale, or to any kind of carrion. When food is abundant it gorges itself like the vultures, and then sits motionless upon the water, so that is may sometimes be taken with the hand. Its hoarse cry has been compared to that of the pelican, but is sometimes more suggestive of the braying of an ass. The single egg is four or five inches long, of a white color, spotted at the larger end. The nestling is white, the young somewhat brownish and of slow growth.

There are seven species. One of these, the Sooty Albatross (*D. fuliginosa*), chiefly found within the Antarctic circle, is called by sailors the Quaker Bird, on account of the prevailing brown color of its plumage.

Flamingo (*Phœnicopterus ruber*), a shore bird of Mediterranean, East Indian, and West Indian regions is essentially a greatly modified Goose. Its legs and neck are very long and its bill abruptly bent downward. It feeds with top of head down, sifting the mud, but retaining the small worms, crustaceans, molluscs, fishes, etc., on which the birds subsist.

The flamingoes are birds of powerful flight, and fly like geese in strings or wedge-shaped flocks. They also swim in deep water, but the legs are too long to be well adapted for this purpose. They are habitual waders, and the webbed membrane of the feet helps to support them on soft, muddy bottoms. Hundreds feed and nest together, and, being large and richly colored, form a brilliant assembly, their exquisite pink plumage sometimes making a striking contrast against a background of dark-green mangroves.

The nests are mounds of mud, from eight to fifteen inches in height, gradually raised year after year, and built at distances of three to four feet apart. The nesting occurs about the end of May, the hatching about a month later. There is usually only one egg.

Grebes (*Podilymbus*).—The grebes are much sought after for their plumage, but their shyness and their great agility in diving and swimming under water render them extremely difficult to shoot. One species known throughout all America is the Dabchick (*Podilymbus podiceps*). Several of the American species have tufts of feathers called "horns" on the head—a feature of the large European Crested Grebe.

The Western Grebe is the largest American species, being from two to two and one-half feet in length. The Horned Grebe and the Eared Grebe are common in America.

Gulls (*Laridæ*) are water fowl, mostly marine. In color they are white to pearl gray, with dark upper parts; those with black heads lose this color in winter. The feet and bills are red or yellow, the sexes alike, but the young

are more dusky than the adults. The Mackerel Gull has the habit of robbing the Oyster Catcher (*Hæmatopus*) of the food secured. Ross's Gull breeds in the unknown regions about the North Pole. This bird has red feet, black bill, and a narrow, black collar.

Pelican (*Pelecanus onocrotalus*) is a native of southeast Europe, Asia and Africa. It is the largest of all swimming birds, and is found on the lakes and rivers of the continents mentioned. There are a number of species, chiefly tropical. The birds have a tail of twenty-four soft feathers, and a long bill, beneath the mandible of which is a distensible pouch for carrying fish. The Pelican of North America goes north into temperate regions in summer, at its breeding time.

Penguin.—The most remarkable peculiarity of these birds is the flattened wing, which is clad with flat, scale-like feathers; the whole limb, unfit for flight, is admirably suited for swimming. The feathers of the penguin—instead of being disposed in feather-tracts, separated by intervals (*apteria*) upon which no feathers grow, as is the case with all other birds, not excepting even the ostrich and cassowary—form a continuous covering to the body. The penguins are entirely confined to the Antarctic and to the south temperate regions—Patagonia, Cape of Good Hope, Australia and New Zealand. In some situations they are extremely abundant, and make their nests in a common area. The nest is little more than a hole in the sand in which the female deposits a single egg. The stupidity of these birds is perhaps due to the inaccessibility of the rocks and shores where so great a number live and breed; having been comparatively little interfered with by man, they show no terror at the sight of him. The plumage of the neck is valued by furriers for collars and tippets; and large numbers of "Johnnies," as the sailors call them, are slaughtered annually.

Swans—See Domesticated Animals.

THE RUNNING BIRDS (*Cursores*)

This group is characterized by a considerable sized body, long neck, flat beak, powerful legs and strong, two or three-toed running feet. The bones are heavy; the wings are stunted, and useless for flying; and the plumage is scanty on the head, neck, legs and abdomen.

Cassowary (*Casuarius*).—A bird of ostrich affinities, living in New Guinea, and other Malay Islands, and Northern Australia. They have rudimentary wings, live in dense forests, head protected by horny helmet, have blue, red and yellow wattles, three-toed feet, the inner toe with powerful claw, used as weapon, eat large quantities of miscellaneous articles, including indigestible ones; and can be tamed. Their cry is a loud croak. Their eggs, five in number, are laid in August and September, in nests on ground, covered in brush. The young are brownish, but gradually become blacker. The helmet is not full-grown until the fifth year.

Emu (*Dromæus*) is closely akin to the cassowary family. There are two species, both Australian—the Common Emu and the Spotted Emu. They differ from the cassowaries in several marked features—e.g., the head and neck are feathered except on cheeks and throat, there is no "helmet," nor are there wattles on the neck, the bill is broad, and the claws of the three toes are almost of equal length. The emu is a large bird, standing about six feet in height. The plumage is like that of the cassowary; the color is predominantly dull brown, darker on the head, neck and middle line of the back, lighter beneath. The naked parts of head and neck are grayish blue, the bill and feet brownish. The young are striped with black. The wings are of course rudimentary, but the legs serve the bird well both in running and kicking. Timid and peaceful in character, the emu trusts to its speed for safety. It is valued on account of its beef-like flesh, abundant oil, and edible eggs, but is unfortunately being destroyed with too great carelessness.

Ostrich.—See Domesticated Animals.

Rhea, also called Nandu and American Ostrich is a South American bird, which form a somewhat isolated group, though nearer to the ostrich than to any other bird. They are incapable of flight, but the wings are rather better developed than in the ostrich. As in the ostrich and the apteryx, the feathers have no aftershaft, and the color of the eggs is white. The male bird incubates. Three species have been described.

GAME BIRDS (*Gallinæ*)

The members of this order are ground-birds, with strong, blunt-clawed feet adapted for scratching up the ground in search of food. The beak is nearly always shorter than the head, and has projecting edges; the wings are generally short, and rounded off; the legs are armored with callosities. All these birds build their nests on the ground, and their young are nest fledglings, leaving the nest on the same day. A number of our domesticated fowl belong to this group.

Bobwhite (*Colinus virginianus*) is known everywhere by the clear whistle that suggests its name. It is loved by every dweller in the country and is better known to more hunters in the United States than any other game bird. It is no less appreciated on the table than in the field, and in many states has unquestionably been hunted too closely. Half the food of this quail consists of weed seeds, almost a fourth of grain, and about a tenth of wild fruits. Although thus eating grain, the bird gets most of it from stubble. It feeds freely upon Colorado potato beetles, chinch bugs, cucumber beetles, wireworms, billbugs, clover-leaf weevils, cotton-boll weevils army worms, bollworms, cutworms, and Rocky Mountain locusts.

Chicken or Fowl.—See Domesticated Animals.

Grouse is a name applied to many game-birds, including quail and partridges. They are well known to be large, plump, somewhat heavy birds, usually short-tailed, and with beautifully variegated plumage, which must often be protective. The largest American grouse, however, is the Cock of the Plains or Sage Cock. The Ruffed Grouse (*Bonasa umbellus*) is distinguished from other grouse by the broad black band near tip of tail. It is found in the northern two-thirds of the United States and in the forested parts of Canada.

The Ruffed Grouse is famed as the finest game bird of the northern woods. It is usually wild and wary and well understands the attacks of hunters. Wild fruits, mast, and browse make up the bulk of the vegetable food of this species; and it is very fond of hazelnuts, beechnuts, chestnuts, and acorns and eats practically all kinds of wild berries and other fruits.

Guinea—See Domesticated Animals.

Partridges (*Tetraonidæ*).—The most common of the Old World is the Gray Partridge. The Snow Pheasants of the heights of the Himalayas may exceed six pounds in weight. The Gray Partridge of India is not palatable as food, but, being very pugnacious, is kept for fighting; the male has two spurs on each foot. There are upward of fifty species of American partridges, among which are the Mountain Quail of California, the Bobwhite (which see), while the Ruffed Grouse is called Partridge in the North and Pheasant in the South. It is shy, forest-loving; the male makes a drumming sound by vibrating its wings. Its tarsus is feathered half way, the head crested, and plumage variegated.

Peacock.—See Domesticated Animals.

Pheasants (*Phasianidæ*).—About forty species of pheasants inhabit southeastern Asia. They are brilliantly colored and have long tails and crests. The males generally are pugnacious; the male of the Blood Pheasant, dwelling on the heights of the Himalayas, has four or five spurs on each foot.

The pheasant exhibits a remarkable readiness to hybridize with other like birds. The Ring-necked Pheasant is a native of the forests of India and China. It is distinguished by a white ring almost surrounding the neck, and is of smaller size than the common pheasant, somewhat different in markings, and has a shorter tail. It is the common pheasant of the Celestial Empire. Among other species of pheasant may be mentioned Diard's pheasant, a native of Japan; Soemmering's Pheasant, also from Japan, one of the most beautiful pheasants known, but terribly pugnacious; and Reeve's Pheasant, a native of the north of China, in which white is the prevailing color, and the tail is of extraordinary length.

Of somewhat different type are the Golden Pheasant and the Silver Pheasant, both natives of China. The Golden Pheasant is one of the most splendid of the tribe. It has a fine crest, and a ruff of orange and black, capable of being erected at pleasure. The tail is very long. The Silver Pheasant is one of the largest and most powerful of the tribe. The Impeyan Pheasant is a native of the East Indies, and known as the "bird of gold."

Ptarmigan (*Lagopus*), a bird nearly allied to the true grouse, differs chiefly in having the toes as well as the legs thickly clothed with short feathers. They are natives of the northern parts of the world, of elevated or of arctic regions. With the exception of the Red Grouse, the species change color on the approach of winter, assuming a white or nearly white plumage. All are esteemed as food.

The Common Ptarmigan is now resident in the Lofoden Island, in Scandinavia, on the Ural and the Altai ranges, etc., and also on the Alps and the Pyrenees. The winter plumage is pure white, except a black band above the eyes of the male, and some black on the under feathers of the tail. In both sexes the wings are always white, but have dark shafts to their quills. In summer the males are predominantly grayish brown above, with blackish head, shoulders, and breast, with white belly, with black tail-feathers tipped with white. In the female a tawny color predominates. In autumn, again the plumage is different, with numerous streaks of slate gray on the upper parts. The white winter plumage is doubtless protective amid the snow, and may be the result of the cold; the summer plumage is not less harmonious with the surroundings.

Turkey.—See Domesticated Animals.

Quail.—See Partridges and Bobwhite.

THE REPTILES (*Reptilia*)

LIZARDS, CHAMELEONS, SNAKES, CROCODILES, TORTOISES AND TURTLES

THE REPTILES are vertebrates which are supplied with a horny or bony skin; they have red, cold blood, breathe by means of lungs, and generally lay eggs; many of them have no feet. When limbs are present, however, they do not raise the body far off the ground, for the elbows and knees are turned outward. Some reptiles pass the winter in sleep.

TORTOISES AND TURTLES (*Chelonia*)

These animals have a wide body, which is enclosed between the arched shell of the back and the flat shell of the stomach. There are land, sea, and river tortoises. In some the head and legs can be retracted inside the shell. Over the outside of the case are horny plates which, in the hawkbill turtle are of value, as they afford the tortoise shell used for combs, etc. Turtles never have teeth, the edges of the jaws being covered with horny material. Most of the species are carnivorous. The largest species are the marine leather-backs of the tropics, which occasionally drift north to New England, and the giant species occurring on the Galapagos Islands, off the west coast of South America, and on some islands in the Indian Ocean.

Land Tortoises have a high arched shell under which the head and feet can be retracted. The feet have separate toes, and are adapted for walking. They are strictly herbivorous. Examples of this family are the large and strong Gopher-tortoises of the Carolinas, which burrow in the earth, the massive Amazon Tortoise, used for food by the natives, the Galapagos Tortoise, and the small Garden Tortoise.

Mud Tortoise (*Emys lutaria*) is frequently seen in Italy and the south of France. It inhabits lakes and slow-flowing waters, and feeds upon

small fish, spawn, frogs, water insects, etc. It lays its eggs in a hole, which it digs in the bank. Its flesh is edible. Small specimens are frequently kept in aquariums, and fed with meat, bread, lettuce leaves, etc.

Sea Turtles have flat shells between which the flipper-like feet and huge head cannot be retracted. There are no nails or separate toes, and the fore feet are much the larger. The Green Turtle (*Chelone midas*) is much esteemed as food, with its eggs. It lives in or near the Gulf Stream, feeds on the roots of eelgrass, comes ashore at night, during May, and lays nearly one hundred eggs, which hatch in six weeks; the laying is usually repeated several times every two weeks, near the first nest. This Turtle may attain a weight of over eight hundred pounds. The Logger-head Turtle, so-called from its huge head and neck, ranges from Brazil to Massachusetts, attains a weight half that of the Green Turtle, and feeds on fish, crustacea, conchs, etc.

The Hawk's Bill (*Eretmochelys*) has pointed plates that supply the "tortoise shell" of commerce. A large specimen may yield as much as eight pounds of the "shell." The beautiful mottled color and semi-transparent characters of this material are well known. Its manufacture is carried on in the East, a fine tortoise-shell being exported from Celebes to China.

Snapping Turtle is a large voracious turtle, common in North America along stagnant waters and along the southern Mississippi where it sometimes reaches the weight of thirty pounds. It lives on fishes, frogs, and shells, and occasionally water-fowl. It has great strength of jaw and snaps when it bites. When fattened, its flesh is often esteemed as a delicacy. It is sometimes known as the Alligator-terrapin or Alligator Turtle.

Terrapin is the popular name of many species of fresh-water and tidal-water tortoises, native to tropical and the warmer temperate countries. About twenty fresh-water species are found in the United States. But the terrapin *par excellence* is the Diamond-back Salt-water Terrapin, highly prized as a delicacy for the table. It is caught in salt marshes along the coast from New England to Texas, the finest being those of the Massachusetts and the northern coasts.

CROCODILES AND ALLIGATORS (*Crocodilia*)

These inhabitants of the rivers and estuaries of tropical regions are somewhat lizard-like in appearance, but in structure they are in many ways much more specialized. They have a scaly, tough skin on the back, four powerful feet, and a long tail. They live chiefly in the water, and only go to the banks to bask in the sun. The jaws are armed with powerful interlocking teeth, which constitute a deadly trap. The valvular nostrils are so situated that the animal can drift along with most of its body submerged, and at the same time breathe quite easily.

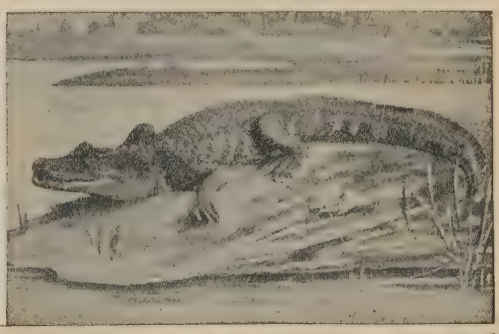
Alligator (*Alligator mississippiensis*) is found in the southern states of North America. It is as voracious as it is bloodthirsty. Should it perceive an unfortunate mammal drinking or browsing on the edge of the bank, it sinks below the surface, and rapidly swims toward the victim by strokes of its powerful, flattened tail. Then comes a sudden snap, aided, perhaps, by a lash of the tail; should the attempt prove successful, the prey is held under water till it is drowned, if too large to be forthwith swallowed. No bullet will pierce the hide on its back. It deposits its eggs in a kind of nest, which it builds with grass and mud on the banks, and defends with great fierceness. It deposits about one hundred eggs in this nest. The alligator is captured in various ways, but there is danger in hunting it.

Crocodile (*Procœlia*) is found in both hemispheres, but especially in Africa; they swarm on the Upper Nile. The crocodile of the Nile is a well-known species, not now found farther north than Thebes, but occurring abundantly farther south and east. Some two or three score of eggs, with delicate, rough, limy shells, about the size of those of geese, are laid in sandy cavities in the bank. The crocodile is now hunted for the perfume of its musk-glands, and also for its skin and fat.

LIZARDS (*Lacertilia*)

These may perhaps be described as the most average of existing reptiles, and have a very wide distribution. Examination of a lizard or its skeleton enables us to grasp very clearly some of the average characters of reptiles, such as the sprawling limbs and long tail. Some of the tropical lizards are of very considerable size, attaining a length of as much as six feet, as in

Crocodiles are cruel, but in one way they serve us, by eating the dead bodies of animals which float down the rivers. But for the crocodiles these bodies might poison the water. Here we see the crocodile and the little bird called the ziczac, which picks the food from between the crocodile's teeth.



The alligators have a covering of horny plates, and terrible jaws and teeth. These teeth are frequently renewed, new ones forming in place of those worn out. Alligators are, in this respect, more fortunate than human beings. In America alligators are protected part of the year, because they kill things which damage the crops.

the iguanas of America, some of which are esteemed as food. These are among the climbing members of the order, other examples being the geckoes and chameleons, both of which are animals of small size.

Chameleons are proverbial for the way in which they rapidly change color if placed among fresh surroundings, so as to harmonize with them. This variable general coloration is protective, because it makes the chameleon invisible to its foes, and also aggressive, as the insect prey of the little lizard are thereby lulled into a sense of false security. The digits are bound together into two groups, and a tongs-like grasping organ of great efficiency is thus constituted. The chameleon is also notable for the relatively enormous distance to which it can suddenly shoot out its sticky club-shaped tongue, for the purpose of seizing insects or other small creatures.

Flying Dragon (*Draco volans*) is found on trees in the island of Java. It generally frequents the trees along the banks of great rivers, in the leaves of which are numerous insects, upon which the flying dragon feeds. As it is as green as the leaves of the trees, it can only be recognized by an experienced eye. It is hunted for its delicate flesh, and also for the eggs, which are found deposited, often fifteen to twenty at a time, in a hollow in the ground.

Gecko (*Hemidactylus maculatus*) is a native of the East Indies and China. At dawn these reptiles creep out of their holes, and with dilated eyes look around for prey. As soon as they catch sight of it, the clumsy creatures spring upon it from a distance of four to six inches, with all the violence and rapidity of an animal of prey. Sucking pads on the feet of the gecko enable it to cling firmly to the most slippery surface, and to crawl about without slipping; its claws, which are sharp and retractile, are also useful to this reptile.

Iguana (*Icuana tuberculata*) is found in the East Indies and in South America. It lives in trees along the banks of rivers, feeding upon the insects. Its usual color is dark olive green. Its flesh is considered a delicacy, being tender and very much like that of a chicken. The eggs, of which the female deposits from four to six dozen at a time, are also eaten.

SNAKES OR SERPENTS

have elongated bodies, covered with plates or scales, and no feet. Many kinds have no poisonous fangs in the upper jaw. Serpents reproduce their species from eggs, and feed upon living animals; those found in colder regions sleep through the winter.

HOW THE SNAKE TRAVELS

The vertebrae are very numerous. With the exception of the most anterior (atlas), all bear ribs, which are very freely movable and are the snake's main organs of locomotion. Snakes are capable of moving with great swiftness. The body undulates from side to side—not up and down—in a wriggling or writhing fashion. The extremely flexible backbone permits of this, but to guard against dislocation the vertebrae are connected by extra locking-joints, which only permit a certain amount of play. It is, however, comparatively easy to break the back of a snake by a sharp blow with a stick or whip.

MOUTH AND SENSE ORGANS OF SNAKES

Snakes are typically carnivorous, and many of them are furnished with powerful poison fangs. The tongue is forked, can be rapidly protruded and retracted, and is an efficient sense organ. Upon it and the well-developed nostrils the snakes largely depend, for neither sight nor hearing is very acute. There are no eyelids, the eyes being covered over by a transparent convex scale. The whole skin is covered with scales, which are folds of the epidermis, continuous with one another. In consequence, when the snake casts its coat—which occurs several times in the year—it casts it in one piece, this being a complete replica of the snake.

THE ORGANS OF CIRCULATION

The heart is four-chambered, as in mammals and birds, and not three-chambered, as in other reptiles and amphibia. The pure and impure blood do not, therefore, mix inside the heart; but as such blending takes place outside, owing to imperfect separation of the great vessels, the net result is much the same as in the lizards.

HOW SNAKES SECRETE POISONS

In venomous serpents some of the glands opening into the mouth secrete a poisonous fluid, which is introduced into the blood of a bitten victim. The largest amount of specialization is found among the vipers, where the teeth are reduced to a pair of hollow "fangs" in the front of the upper jaw, and there are two large poison-glands, one on either side of the head, giving it a characteristic resemblance to the ace of spades. In a state of rest, when the mouth is shut, the poison-fangs are pressed against the roof of the mouth, with their tips directed backwards. But when the snake opens its mouth and "strikes," the fangs are rotated forward so that their sharp tips can be brought into action. The poison flows into the upper end of the tooth-canal and, in vipers, enters the wound by a small hole on the side of the tip. Were it at the end a blockage might result. We have, in fact, an anticipation of the device used in the construction of the needles employed with hypodermic syringe.

WHY SNAKES ARE COLORED

Snakes, like lizards, are very commonly colored in such a way that they may harmonize with their surroundings. A good many poisonous forms, on the other hand, advertise their dangerous properties by brilliant hues and striking patterns. Such "warning coloration" is seen, for example, in the coral snakes of tropical America, which are marked with broad red rings, alternating with others of whitish tint, shading into black at the front and back of each ring. These coral snakes serve as models which certain harmless forms unconsciously mimic, thus securing a certain amount of immunity from attack by sailing under false colors.

SOME SNAKES THAT WARN

In the American rattlesnakes, at each periodical casting of the skin or slough, a little knob remains at the end of the tail. A series of these loosely united together make up the "rattle," used for the production of warning sounds. The "hissing" of a snake has the same purpose. Venomous snakes also commonly assume a warning attitude, raising the front part of the body from the ground and, in some cases, as illustrated by the cobra, inflating a kind of hood—in this particular instance bringing a black, spectacle-shaped mark into prominence.

But in these and other animals it must not be supposed that the "warning" is for the benefit of the prey, but may be taken as a hint to aggressive birds and mammals that discretion is the better part of valor. The success of this device is shown by the terror with which all monkeys regard serpents.

THE ART OF SNAKE CHARMING

This art has been practised from very ancient times in Africa and the East, and often remains from generation to generation the profession of a family. It is sometimes practised for alleged useful purposes, since the "charmers" are often employed to clear a house of its unwelcome snake visitors. For the most part, however, it is, like conjuring, a form of popular amusement. In India it is practised by several distinct classes of men, who vary in the methods and success of their art. The charmers usually take good care to play with snakes whose fangs or even poison-glands have been carefully removed, or even to use those which are not venomous at all. The frequent use of a musical pipe, and the way in which the snakes seem to respond to the sounds, are facts interesting to naturalists, who believe that at least many snakes are very deaf. The charmers sometimes manifest a fearlessly confident dexterity in handling intact venomous snakes.

THE WISDOM OF THE SERPENT

In correlation with the presence of a well-developed brain, snakes may be regarded as the most intelligent of reptiles, though the idea of their "wisdom" probably took origin in their stealthy ways, and the curious "fascinating" powers already mentioned. They are among the numerous animals that have been the objects of superstitious worship.

AMERICAN AND OTHER SNAKES

The group of North American snakes include a large number of Colubrine snakes and about a score of pit-vipers or rattlesnakes. Among the Colubrine forms are the water-snakes, the black snakes and coachwhip snakes of the genus Coluber, the pine-snakes, the king-snakes, the ring-necked snakes and so on. Besides the rattlesnakes proper, there are the related copperheads and mocassins. Outside these two families there are the boa-like and venomous coral-snakes, and the harlequin snake.

There are no snakes in Ireland, nor are they represented in most oceanic islands such as New Zealand and Iceland. The pythons and boas are distinctly tropical snakes: the pythons in Africa, India, Malaya, Australia; the boas in tropical America. Among the most important venomous snakes of India are the following: the cobra, the Hamadryas, the Krait, the Sankni, and the sea-snakes.

AMPHIBIANS (*Amphibia*)

FROGS, NEWTS, SALAMANDERS AND TOADS

THE AMPHIBIANS hold a middle position between the reptiles and fishes. The name, Amphibia, means "double-lifed" or living on both land and water. The larvæ, after leaving the eggs, live in the water like fishes; they gradually accustom themselves to live in the air, and when their metamorphosis is complete they breathe by means of lungs.

They have red, cold blood, and are enveloped in a smooth, often slippery, skin. Some have tails, like the newt and salamander, and others are tailless, like the frog and toad.

Frog (*Rana temporaria*) is familiar all over America, and is found in the early spring in all our ponds, ditches, and lakes, in which also large quantities of frog's eggs can be seen. When fully developed, frogs have a short, tailless body, a large head, and four legs, the toes being frequently joined together by a membrane.

They deposit their eggs (*a*) in the water, either in masses or in strings. The larvæ (called tadpoles) have a long, flattened tail (*c*); they have no legs, and breathe through gills (*b*), and are therefore very different from the fully developed frog. The gills gradually disappear, and lungs are developed; the fore legs make their appearance, the hind pair developing first (*d* and *e*); the tail gradually diminishes, and finally disappears (*f*). The change, is then complete, and the young frog leaves the water to begin its life upon land. The common frog leaves the water immediately after spawning, and makes itself very useful by destroying numerous injurious insects and snails.

In this country the commoner species of frogs embrace the BULL FROG (*R. catesbiana*), which is the largest, sometimes being eight inches long. Its sonorous bass notes are familiar to the ear, and to the eye it presents a greenish appearance, brightest on the head, with faint spots on the back and blotches on the legs. It occurs from Kansas eastwards, and its hind-legs fried are considered a delicacy.

The SPRING FROG (*R. clamatans*) is widespread, about three inches in length, green and black spotted above and white below.

The common GREEN FROG (*R. virescens*) has irregular black blotches, and is paler beneath. Both average about three inches in length.

DEVELOPMENT OF THE FROG—FROM THE EGG TO THE FULL-GROWN ANIMAL (See Page 223)

The Pickerel Frog (*R. palustris*) is light brown in color, with two rows of large oblong blotches of dark brown on the back and spots elsewhere. It is smaller in size and less aquatic than most other kinds.

The Wood-Frog or Tree-Frog (*R. sylvatica*) is more closely related in structure to the toads than to the frogs proper. The tree-frogs show various interesting adaptations to their arboreal life. The last joint of each toe bears a claw, on which is supported a disc or sucker by means of which the animals can cling to a perfectly perpendicular surface. Most of them also exhibit in a greater or less degree the power of color-change, where the color varies from a dark brown to a lichen-like gray or a brilliant green.

Newts are separated from the lizards on account of their changes while young. Like the frogs, they are first tadpoles, and do not assume their perfect shape until six weeks after their exclusion from the eggs. The common Newt is a beautiful inhabitant of the ponds, ditches, and still waters.

The male newt is distinguished by a beautiful crimson tipped wavy crest of loose skin, that extents along the whole course of the back and tail, and which, together with the rich orange-colored belly, makes it a most beautiful creature. The female has a singular habit of laying her eggs upon long leaves of water-plants, and actually tying them in the leaf by a regular knot.

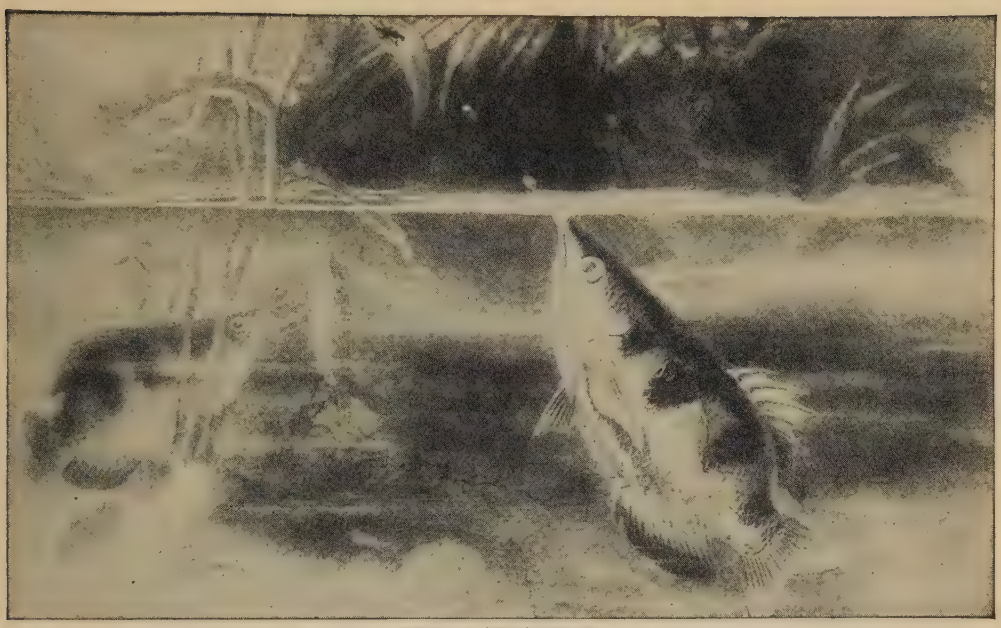
Salamander (*Salamandra maculata*) is a nocturnal animal, and found in woods and hedges under decayed leaves and similar matter. Their bodies are longer and similar to the lizard. Most of the species lay eggs, usually in the water. From these the gilled young hatch out. They are carnivorous or insectivorous. In the adult stage, some are aquatic, but more live on the earth burrowing beneath the soil or under stones, seeking their prey at night. None are poisonous, except that they have glands in the skin which secrete an acrid juice. Our largest species is the mud puppy (*Necturus*) of the Mississippi basin; the largest living species is the giant salamander of Japan, three feet in length.

Toad (*Bufo*).—Toads are distinguished from frogs by the absence of teeth, by the roughness of the skin, by peculiarities in the breast-bone, and by the shorter hind-legs.

The common toad is a shy, nocturnal animal, hiding during the day in dark, damp places, crawling about at night in search of insects, grubs, slugs, worms, and the like. Its appearance is familiar—a dirty brownish-gray color, a warty skin, a flat head, swollen parotid glands above the ears, bright jewel-like eyes with a transverse pupil, slightly webbed toes. They are heavier and clumsier than frogs, and cannot leap nearly so far. During the winter they live in the mud or in holes. In spring they pair, and the females lay in the water-pools their numerous eggs in strings about three or four feet in length. The tadpoles are smaller and darker than those of frogs, and do not accomplish their transformation into toads until autumn.

Toads are widely distributed over most parts of the continents, but are most abundant in tropical regions. The common toad of North America ranges everywhere east of the Rocky Mountains. In the Southern States another very similar species is numerous, and other species are found in the West. The largest toad of tropical America measures eight inches in length.

The Laughing Toad (*Bombinator igneus*) is the smallest of the toads, with a yellow spotted belly.



THE ARCHER FISH
is one of the strangest of all fishes in its habits. It shoots down flies and other small creatures from the bank by means of a series of well-aimed "bullets" of water, which it ejects in rapid succession.

THE FISHES (*Pisces*)

THE FISHES are the last class of the vertebrated animals, and have cold, red blood. The elongated body generally tapers off to the tail; the head and neck are large; the limbs are called fins, and are such as to make efficient paddles. They are usually one or more fins in the middle line of the back and one or two in a corresponding position beneath the tail (anal fins); while the tip of the tail is terminated by a caudal fin, the chief organ of swimming. All of the fins are supported by a skeleton of rays, either horny or spinous in character.

There are but two chambers to the heart, and the occurrence of a swim bladder, an organ for regulating or recognition of the depth of the water in which the fish is, is very frequent. Externally fish have a defensive armor of scales or bony plates embedded in the skin. They breathe throughout life by means of gills, which are delicate folds or filaments connected with openings (gill slits) in the sides of the throat. The fishes live in water, and reproduce their species by eggs.

There are several great groups of fishes, distinguished by the presence of a cartilage or bony skeleton, by having the gill slits free or under a gill cover, by characteristics of the skull, presence or absence of air bladder, and by peculiarities of the digestive tract and nervous system.

(1) The bony, or true fishes (*Teleostei*), which include all the most familiar fresh-water and marine forms; (2) the Cartilaginous fishes (*Elasmobranchii*), including sharks, dog-fish, bays and skates; (3) the heavily-armored fishes (*Ganoidei*), like the sturgeons and bony pike; and (4) the double-breathers (*Dipnoi*), of rare occurrence.

THE BONY FISHES (*Teleostei*)

These have a bony skeleton, and a well-defined vertebra, or backbone; their bodies are mostly covered with scales.

Alewife (*Alosa tyrannus*), a fish of the same genus with the Shad, which, at the beginning of summer, appears in great numbers on the east coast of North America, and enters the rivers to spawn. It appears in Chesapeake Bay in March, on the coasts of New York and New England in April, and on those of the British provinces about May 1. It abounds in the bay of Fundy, but is more rare in the gulf of St. Lawrence; and the bay of Miramichi appears to be its northern limit. Its length is not more than twelve inches. The alewife is called spring herring in some places, and gaspereau by the French Canadians.

Bass (*Labrax*) is a member of the perch family. The shape is salmon-like. The color is without the zebra-like bars of the perch, and shades off from dusky blue above to silvery white beneath.

The Striped Bass or Rock-fish of the United States (*L. lineatus*) very nearly resembles the common bass, but attains a larger size. It is one of the most important of American food fishes, and sometimes weighs fifty pounds. It is caught from July to September. The name Stone Bass is given to various forms. A Yellow Bass is found in the Lower Mississippi valley, and the Fresh-water Bass is an imported fish found in the streams of eastern New York and the other middle states.

Bluefish (*Temnodon* or *Pomatomus saltator*).—A fish common on the eastern coasts of America, allied to the mackerel. The only known species is abundant on the east coast of North America. The upper parts are of a bluish color, the lower parts whitish, a large black spot at the base of the pectoral fins. The mouth is crowded with teeth, the jaws are furnished with large ones. The bluefish preys on other fishes, such as the menhaden and mackerel, the shoals of which it pursues. It sometimes attains a length of three, or even five feet, and a weight of fourteen pounds. It is often caught by trolling, as it bites readily at an object drawn swiftly through the water. It is much esteemed for the table.

Bullhead.—In the United States the name is given to some species of catfish or horned pout; in England to a smaller fish, allied to our miller's thumb, but belonging to a different group from the catfish.

Carp. See page 256.

Cod (*Gadus*), a genus of bony fishes in the soft-rayed order. This is probably the most important food fish and is taken in enormous numbers on the coasts of Europe and of eastern North America. It occurs in the northern Pacific as well. It feeds upon other fishes as well as on shellfish, and large specimens weigh over one hundred pounds. Allied to the cod are the haddock, pollack, hake and cusk.

Eel (*Anguilla vulgaris*) has elongated form, and has become proverbial on account of its slipperiness and tenacity of life. In the rivers and lakes only female fish are found; the males keep to the open sea. The former go down to the sea in the autumn; but in the following spring the young female fish swim up the rivers in immense numbers, while the young males remain in the sea. During the day the eel conceals itself in the mud, but at night it exhibits its voracious qualities by swallowing numerous fish, water insects, crabs, mussels, and worms. Its firm, delicate flesh is much esteemed.

Flounder (*Pleuronectes flesus*), a common species of flat-fish, of wide distribution in shallow waters in north temperate countries. It is the Scotch "fluke," and the Swedish "flundra," and differs but a little from the plaice and dab, two of the commonest neighbor-species. Like other flat-fishes, the flounder is asymmetrical, and swims or rests on one side, almost always the left, the eye of which is in early youth, brought round to the upturned surface. It measures about one foot in length, and about a third as much between the dorsal and the ventral edge, without including the fringing fins.

Of the two dozen related species, the plaice, the dab, the smear-dab, and the craig-fluke are the commonest.

Flying-fish.—Various fishes which have the power of sustaining themselves for a time in the air by means of their large pectoral fins. Generally, however, the name is limited to the species of the genus *Exocoetus*, which belongs to the family of mackerel-pikes. These can pass through the air to a considerable distance, sometimes as much as two hundred yards, to escape from the attacks of other fishes, especially the dolphin. They are most common between the tropics.

Goldfish. See page 256.

Haddock (*Gadus æglefinus*) is a fish of the same genus as the cod, and much resembling it in general appearance; but distinguished by a notched tail and a white line along the side. In habits the two are much alike, being voracious, eating anything edible, but largely clams and the like.

Halibut (*Hippoglossus vulgaris*), the largest of all the flat-fish and in form more elongated than the flounder or the turbot. The halibut, though esteemed for the table, is not to be compared in quality with the turbot; its flesh is white and firm, dry and of little flavor. It attains a great size; specimens have been caught weighing at least five hundred pounds, and one caught in Iceland was little short of twenty feet long.

Herring (*Clupea harengus*) belongs to the order of bony fishes and is spread over the whole North Atlantic. It is of great economic importance, and occurs in large schools, swimming through the sea with open mouths, scooping up the minute life for food. Immense numbers are taken both here and abroad, the annual catch for Europe and America being estimated at a billion and a half pounds. The young are also taken in vast quantities and are preserved as American sardines. With us most of the adults are smoked and dried.

Mackerel (*Scomber*), a genus of fishes which also includes the tunny, bonito, and sucking fishes. It is an important food fish occurring in the North Atlantic and characterized by its slender shape, the series of little finlets on the tail and the deeply notched caudal or tail fin. It is taken both by hooks and by seins. Some are eaten in the fresh condition and some are salted. It goes in large schools. Allied is the Spanish mackerel of our southern waters and the large horse mackerel which is more common in the Mediterranean, where it is called the tunny.

Perch (*Perca*).—Spiny-finned fishes, well represented by the Fresh-water Perch (*P. fluviatilis*), which is widely distributed in lakes, ponds, and rivers in Europe, Northern Asia, North America and Britain. It is of a greenish-brown color above and golden yellow on the under parts, with six or seven indistinct dark bands on the back. In length it measures about eighteen inches, and its height is about a third of this. It sometimes weighs from three to five pounds, and a prize of nine pounds has been recorded.

Porgy.—A food fish on the eastern coast from Cape Cod south, known also as scup. It should not be confounded with the pogy or

menhaden, one of the herrings, which is taken extensively for oil.

Pollack (*Gadus pollachius*), a fish, belonging to the cod genus. It is about the size of the coal-fish, is active in habit, and is frequently caught. The lower jaw projects beyond the upper, and there is no barbel. It has commercial value in the English Channel and off the coasts of Newfoundland. Allied species, which promise a valuable future, abound from Puget Sound to Alaska on the Pacific coast.

Salmon (*Salmo*), a genus of well-known fish which inhabits both salt and fresh waters, and ranks among the food-fishes. It generally attains a length of from three to four feet, and an average weight of from twelve to thirty pounds, but these limits are frequently exceeded. The adult fish is a steel-blue on the back and head, becoming lighter on the sides and belly.

It usually continues in the shallows of its native stream for two years after hatching, and during this period it attains a length of eight inches. When the season of its migration arrives, the fins have become darker and the fish has assumed a silvery hue. It is now known as a *smolt* or *salmon fry*. The smolts now congregate into shoals and proceed seaward. On reaching the estuary they remain in its brakish water for a short time and then make for the open sea. Leaving its native river as a fish weighing, it may be, not more than two ounces, the smolt, after three months' absence, may return to fresh water as a *grilse*, weighing four or five pounds. In the grilse stage, the fish is capable of depositing eggs. After spawning in the fresh water the grilse again seeks the sea in the autumn, and when its second stay in the ocean is over it returns after a few months' absence as the adult salmon, weighing from eight to ten pounds. The salmon returns as a rule to the river in which it passed its earlier existence. The fertility of the fish is enormous.

Salmon are caught by the rod, and by means of nets, the fishings being regulated by law. There are important fisheries in some European and North American rivers. In Europe the fish is found between the latitudes of forty-five and seventy-five degrees, in North America in corresponding latitudes. The flesh when fresh is of a bright orange color, and is of highest flavor when taken from the sea-feeding fish. In the waters of northwestern America are several salmon belonging to a distinct genus, including the quinnat or king-salmon, blue-back salmon or redfish, silver salmon, dog salmon, and humpback salmon. The quinnat has an average weight of twenty-two pounds, but sometimes reaches one hundred pounds. Both it and the blue-back salmon are caught in immense numbers in the Columbia, Sacramento, and Frazer rivers (especially in spring), and are preserved by canning.

Sardine, or Pilchard (*Clupea pilchardus*) is an important fish closely related to the herring and sprat. In size it grows from ten to fourteen inches; in color it is bluish-green above, whitish underneath and on its sides. It is entirely marine in habit, and its eggs float on the surface of the sea, unlike those of the herring, which are attached to objects at the bottom. The young, before it has attained maturity, is known as the sardine, and as such forms a valuable fishery; the full-grown pilchard is used as an article of diet as well as for bait. The method of capture is usually by drift-net. It is most abundant off the coasts of Portugal, and in the English Channel and the Mediterranean.

Shad is a migratory fish of great food value. It ascends all of the rivers of the eastern coast of the United States every spring to lay its eggs. It is closely related to the herring, but is much larger, and were it not so full of bones it would stand very near the head of food fishes.

Smelt (*Osmerus*) is a genus of the Salmon family, characterized by strong fang-like teeth, and by rather large scales, which readily fall off. The form is very trout-like, but rather more slender; the tail is larger in proportion, and more forked. The back is whitish, tinged with green; the upper part of the sides shows bluish tints, the lower part of the sides and the belly are of a bright silvery color. The smelt has a peculiar, cucumber-like smell, and a delicious flavor, on account of which it is highly esteemed for the table.

Sole (*Solea*) is a fish oval in shape, the outline of the snout being semi-circular, and projecting somewhat beyond the mouth. The Common Sole (*S. vulgaris*) is a fish of high value in European markets. It lives in European seas from the Mediterranean to the north of Denmark, and is rarely caught on the American side of the Atlantic Ocean, although numerous closely allied kinds abound.

Sword-fish (*Xiphiidae*) are abundantly represented in tropical and subtropical seas. They are among the largest bony fishes, sometimes measuring twelve to fifteen feet in length. The sword, which may be over three feet long, is formed from a compressed prolongation of the upper jaw, and is often strong enough to stab whales fatally, or less advantageously to pierce the bottom of a ship or the planks of a boat. Sword-fish are said to attack whales and other cetacea, and also boats and canoes, and even large vessels.

Trout, a name applied to various members of the Salmon family. The Common or Brown Trout (*Salmo fario*) varies greatly in appearance, not only with individuals but at different seasons, and this variability has led some authorities to distinguish a number of subspecies.

At midsummer an adult trout is usually brownish or olive in color, with pure white on the belly and gold on the flanks, while the back varies from olive or pale brown to nearly black. The dorsal fin and sides are spotted with black and often also with scarlet. The scales are circular, thin and minute. When the spawning season begins in autumn all the color disappears and the body becomes slimy to the touch. The head of the male is larger than that of the female, and the lower jaw bears a cartilaginous knob. It feeds on a large variety of food, different kinds appealing in turn. It is by cunning imitations of some prevailing fly that the fisherman makes his most cherished captures.

The artificial hatching of trout is now carried on extensively, and lakes and streams can be stocked or replenished with fish if they are not too polluted.

The Bull Trout or Sea Trout (*S. eriox*) most resembles the salmon in appearance and habits, though thicker in proportion to its length, and with larger and more numerous dark spots on the gill-covers and scales.

The Salmon or White Trout (*S. trutta*) is a more elegant fish, and its flesh is much more delicate in flavor. The habits of both are similar.

The Rainbow Trout (*Salmo irideus*) of America has been introduced into many parts of the world; in New Zealand, especially in Lake Taupo, it attains the greatest size, many tons being caught yearly.

Whitefish (*Coregonus clupeiformis*), the common whitefish, is the largest of all the American lake whitefish. It is very highly esteemed for food, ranking, indeed, as one of the finest table fishes. Its range extends from Lake Champlain to the Arctic Circle.

CARTILAGINOUS FISHES (*Elasmobranchii*)

These fishes have a cartilaginous, pliant, undeveloped skeleton, and are not covered with true scales. They include rays, sawfish, sharks, skates and others.

Ray, a popular name applied to many of the flat cartilaginous fishes: Thornbacks, Electric Rays, Sting-rays, Eagle-rays are representative. They lead a somewhat sedentary life at the bottom of the sea, moving sluggishly by undulations of the pectoral fins which form a large part of the flat body. Many attain a large size, sometimes measuring six feet across.

Sawfish (*Pristis*) are distinguished by the prolongation of the snout into a formidable weapon bordered on each side by sharp teeth. Some species are found off the southern coasts of North America and in the Gulf of Mexico, and in the Mediterranean and many other seas. With its saw, which is sometimes six feet in length, the sawfish slashes or rips up its prey, and its assult is often fatal to large whales.

Sharks are a group of very simple fishes, which have only a cartilage skeleton, no bone being developed anywhere in them. They have the gill openings on the side of the neck separate, and in all of the common species the mouth is on the lower side of the head instead of at the tip, as in ordinary fishes. The tail has unequal lobes, the upper lobe being much the larger. There are always four paired fins and one or more on the back. The size of the sharks varies from the smaller dogfish, about two feet long, to the great basking shark, some forty feet in length. Most of these species are very voracious, but the tales of man-eating are often exaggerated, although occasionally they may occur. Some of the largest species feed exclusively on shellfish. The flesh of several species is good to eat, but they are mostly neglected in America. The livers are very rich in oil, which commands a good price for use in dressing leather. In some species the skin has small spines and was formerly used (it was called shagreen) instead of sandpaper. Skin with larger plates is sometimes used in the manufacture of pocketbooks, etc.

Skates (*Raia batis*).—A group of fishes, closely related to the sharks, but having the body flattened from above downward, and with the anterior fins so united to the side of the head and the body that it has a rhomboid appearance and the tail seems like an inconsiderable appendage. The mouth and the gill openings are on the under surface. The animals are bottom feeders, living on clams and mussels, buried in the mud. In Europe some of the smaller species are used for food. Another has a large electric battery on either side of the head, capable of giving very strong shocks. This is called the torpedo.

ARMORED FISH (*Ganoidei*)

These include, among others, the Bony Pike and the Sturgeons.

Bony Pike or Garfish.—A remarkable genus of fishes inhabiting North American lakes and rivers, and one of the few living forms that now represent the order of ganoid fishes so largely developed in previous geological epochs. The body is covered with smooth, enameled scales, so hard that it is impossible to pierce them with a spear. The common garfish attains a length of five feet, and is easily distinguished by the great length of its jaws.

Sturgeon (*Acipenser*).—These large, sluggish fishes, some reach a length of over ten feet, and live on worms, crustacea, and mollusks. The body is long and narrow with five rows of bony shields. There are many species of sturgeon, all confined to the northern hemisphere. They live in the sea and great lakes, and ascend the great rivers. All supply valuable commodities, for which they are regularly captured on a large scale. These commodities are their flesh, which is palatable and wholesome, their roe (caviare), and their air-bladders, from which isinglass is made.

The most important sturgeon-fishery in Europe is that of the Volga and the Caspian Sea. The flesh of the fish is salted, and caviare and isinglass made on a large scale from the roes and air-bladder.

The Sterlet (*A. ruthenus*) is a much smaller species, which is common in the Black and Caspian Seas, and ascends the Danube as far as Vienna. It is one of the principal objects of the sturgeon fishery on the Volga.

In America sturgeon flesh is eaten fresh, and caviare is made both in Georgia and in San Francisco; but there is no great fishery in any particular district, and the manufacture of isinglass does not receive much attention. The sturgeon of the great lakes (*A. rubicundus*) and the Shovel-nose of the Mississippi valley are the chief American species.

LUNG-FISHES OR DOUBLE-BREATHERS (*Dipnoi*) are at present represented by three fresh-water types, the insignificant remnant of a group that was once dominant in the sea, and would have become entirely extinct if some of its members had not taken to live in the waters of the land. These types are the eel-shaped mud-fishes of West Africa (*Protopterus*) and South America (*Lepidosiren*), and a Queensland form (*Ceratodus*). In all these the swim-bladder has been converted into a regular lung, which returns purified blood to the heart. The African form lives in streams which are liable to dry up, and

were it not for the possession of a kind of lung capable of breathing air, it would perish during the dry season, whereas it remains embedded in the mud in a torpid state till the rains return.

The Queensland lung-fish lives under somewhat different conditions, for its native rivers do not entirely dry up, but are reduced to a series of deep holes connected by mere trickles of water. These holes become so foul from decaying vegetation and dead fish that the possession of a lung is a vital matter, and if the *ceratodus* were not able to come to the surface and breathe air it would probably succumb.

THE MOLLUSCS (*Molluska*)

SNAILS, CUTTLEFISHES, SQUIDS, OCTOPUS, TUSK SHELLS, BIVALVE MOLLUSCS, OYSTERS

THE MOLLUSCS have no limbs. The body is surrounded by a membraneous sac, from the secretions of which in many species a chalky shell is formed. The organs of circulation, digestion, and respiration are well developed. The under side of the body is thickened into a fleshy "foot," by which locomotion is effected, and there is a well-marked head.

The Molluscs are divided into five classes: (1) Snails and Slugs (*Gastropoda*). (2) Cuttlefishes (*Cephalopoda*); (3) Tusk Shells (*Scaphopoda*); (4) Bivalves (*Lamellibranchia*); (5) Mail Shells (*Protomollusca*).

Argonaut (*Argonauta*) belongs to the two-gilled cuttle-fishes, and are distinguished by the females possessing a single-chambered external shell not organically connected with the body of the animal. The males have no shell and are of much smaller size than the females. The shell is fragile, translucent, and boat-like in shape; it serves as the receptacle of the eggs of the female, which sits in it with the respiratory tube or "funnel" turned toward the carina or "keel." This famed mollusk swims only by ejecting water from its funnel, and it can crawl in a reversed position, carrying its shell over its back like a snail. The argonaut, or *paper-nautilus*, must be carefully distinguished from the *pearly-nautilus* or nautilus proper.

Cuttlefish.—One of the mollusks in which there are ten arms around the mouth. The internal shell is calcified and is used as a supply of lime for cage birds. They have also an ink bag, the secretion of which furnishes the pigment sepia. Cuttle-fish are an important article of food in southern Europe.

Octopus.—A mollusk with a rounded body, and a small head bearing a pair of well-developed eyes, the mouth surrounded by eight long arms, each arm bearing numbers of suckers by which the animals hold their prey. Inside the mouth is a pair of jaws, shaped much like those of a parrot. Most of the species are small, possibly averaging a weight of five pounds, but some on the Pacific coast spread nearly twenty-eight feet. The octopus is eaten extensively in the Mediterranean countries.

Oyster —Possibly the most valuable of all of the mollusks. There are various species in all parts of the world, but the best is the American species, which now occurs from Cape Cod to the Gulf of Mexico. Formerly it extended to the coast of Maine, and even now there are scattered beds in the Gulf of St. Lawrence. The oyster grows in shallow water, fastening its shell to some rock or shell, and in this way large beds are formed. They are also planted; that is, the young are taken and placed in favorable situations for rapid growth.

The oyster contains but comparatively little nourishment, though eaten extensively. The European oyster is smaller than ours and has a coppery taste.

Allied to the true oysters are the PEARL OYSTERS, especially abundant around Ceylon. These have the interior of the shell lined with mother-of-pearl, and when foreign particles get between body and shell they are covered with the same substance, thus forming the pearls used for adornment. These oysters are obtained by diving; the animal matter is allowed to rot, leaving the pearls behind. The shell is also of value, furnishing material for knife handles, buttons, etc., though most of our pearl buttons are now made from the shells of fresh-water mussels from the Mississippi valley.

Scallop (*Pecten*), a well-known bivalve, one of those with a single muscle closing the shell. The valves are fan-shaped, the left often more or less flat, the right more markedly arched; both are marked with sinuous radiating ridges, to which the name pecten (*Lat.* "a comb") refers. The hinge-line is without teeth, and is extended laterally in two ears. The small finger-shaped foot is usually marked with bright orange or red color. The scallops are widely distributed in all seas, at depths of three to forty fathoms.

Snails.—A common name used for any mollusk with a coiled shell. In the narrower meaning it includes only those forms which occur on land. These land-dwelling forms have a slight shell, into which the whole body can be retracted. They feed exclusively on vegetation, which they rasp by means of a long ribbon, just inside the mouth, the surface of which is covered with thousands of minute teeth, so that the whole is a flexible file. The animals creeps about on a broad sole, and has four tentacles on the head, one pair of them bearing the simple eyes at the tip. Snails do considerable damage where they are numerous. One species is eaten by many in Europe, especially in France and Italy. Over ten thousand species are known.

The shells of sea snails are often of great beauty, and large sums have been given by

collectors for specimens of unusual elegance or rarity, fifty pounds having been paid for a single example of a species of cone shell (*Conus*). The helmet shells (*Cassis*) are made up of differently colored layers, and on account of their beauty have been largely employed for the carving of cameos.

Squid.—A mollusk nearly related to the cuttle-fish. It has a barrel-shaped body, with a head in front bearing ten pairs of tapering tentacles, each with numerous suckers. On the side of the head is a well-developed eye. Squid live largely on small fishes which they catch with the tentacles, biting them with a pair of parrot-like jaws. They are largely used as bait in fishing, and to a limited extent as food. The average length is a foot or two, but in the seas around Newfoundland and Japan giants are occasionally found with bodies a dozen feet in length and tentacles adding thirty feet to this.

Tusk Shells are a small group of burrowing marine forms, in which the body is covered by a long, curved shell resembling a tusk in shape. There is a small hole at its tip, through which the water which has been used in breathing makes its exit. An imperfectly developed head and a rasping organ are present, and burrowing is effected by a long foot with a three-lobed end. The food consists of small organisms, which are apparently secured by the agency of a bunch of filaments with thickened sticky tips that can be protruded from the mouth of the shell. In some respects these animals are intermediate in structure between typical sea snails and bivalve molluscs.

JOINTED-LIMBED ANIMALS (*Arthropoda*)

CRABS AND LOBSTERS, SCORPIONS AND SPIDERS, INSECTS AND GRASSHOPPERS

THIS great division of the animal kingdom includes far more numerous species than any other, and is abundantly represented in both salt and fresh water, on the land and in the air. It consequently includes both *air-breathers* and *gill-breathers:* the former, typical land insects; and the latter, chiefly crustaceous.

CRABS AND THEIR ALLIES (*Crustacea*)

The Crustaceans breathe by means of gills, and their bodies consist of rings. They have two pairs of feelers and two pairs of jaws, to which are mostly joined one or more pairs of jaw feet. All the remaining rings of the body may have a pair of limbs each. The head bears two pairs of feelers. Crustaceans commonly hatch out as free-swimming larvæ, like the adult in form.

This large class of jointed-limbed animals includes lobsters, prawns, shrimps, crabs, and other familiar forms, the great bulk of which are aquatic, though the wood-lice have become adapted to a life on land.

A GROUP OF CRUSTACEANS
1. Common Lobster. 2. Thornback Crab. 3. Land Crab. 4. Hermit Crab. 5. Barnacle. 6. Scorpion. 7. Antarctic Trilobite.

Crab.—In this class of Crustaceans the abdomen is small and folded under the anterior part of the body. Over two thousand species are known, differing greatly in size, shape, and in other respects. The great majority are marine, but there are a few which spend their entire life on land, only going to the water once a year to lay their eggs. The largest is the great spider crab of Japan, whose legs may stretch out a dozen feet. One species on the Atlantic coast is taken at molting time in great numbers and forms the favorite soft-shell crab of the table. The hermit crabs have the abdomen soft, and to protect this vulnerable part, they insert it in the shell of some dead snail, and carry this about with them wherever they go.

Barnacle.—A family of marine crustaceous animals enveloped by a mantle and shell, composed of five principal valves and several smaller pieces, joined together by a membrane attached to their circumference. They are furnished with a long, flexible, fleshy stalk, provided with muscles, by which they attach themselves to ships' bottoms, submerged timber, etc. They feed on small marine animals, brought within their reach by the water and secured by their tentacula. Some of the larger species are edible.

Crayfish.—Small, fresh-water crustaceans, which resemble the lobsters in appearance. They usually live in burrows in the banks or bottoms of streams and feed on decaying animal matter. In Europe they form a considerable element in the food supply and are bred in ponds. A large number of species occur in the United States, and are always to be found in the larger markets.

Lobster.—The most important of the crustaceans. One species occurs on our east coast, another on the coast of northern Europe. The body is divided into two regions, the anterior bearing, besides the parts used in taking food, a pair of large pincers and four pairs of walking feet. At the front of the head are two pairs of feelers, which are sensory, and a pair of eyes on the ends of short stalks. The lobsters are fond of decaying fish and are among the scavengers of the sea. They are caught in large traps, called lobster pots, made out of lath and baited with decaying fish. The annual catch on the New England coast is estimated at about thirty million pounds, the average weight of a lobster being between two and three pounds. Farther south on our east coast, in California and the Mediterranean a different animal is called lobster.

Prawn.—Crustaceans nearly allied to shrimps and lobsters, but not exclusively marine. They vary in size from a couple of inches to over a foot in some tropical forms. Many of them are semi-transparent, and exhibit very fine colors. On the approach of night they change to a beautiful blue, but the meaning of this "sunset" coloration is not fully understood. Some of the deep-sea prawns are blind; others possess enormous eyes, and many emit a phosphorescent light. They may be caught in putting nets or in osier baskets, like those used for trapping lobsters. They are esteemed for eating even more highly than the shrimp.

Shrimps.—Small crustaceans allied to the lobster, most of them inhabitants of the sea. In many countries they form an important part of the diet, but with us they are little used with the exception of one or two southern species which are used as a basis for shrimp salad. Shrimps are very abundant off our coast and could be made an important fishery.

SCORPIONS AND SPIDERS

In this class of insects the head and thorax are joined together in one mass, on which they have two pairs of jaws, and four pairs of legs.

Scorpions.—These spider-like animals have four pairs of legs and a pair of large pincers, as well as a small pair on the anterior half of the body; while the hinder portion consists of at first a broad region, followed by a narrower one, the whole terminated with a sting, with which a poison gland is connected. The animal strikes by bending the end of this tail over the back. Its sting is very painful, but rarely if ever is it fatal. Scorpions occur as far north as Nebraska, but are more common in the tropics. They bring forth living young and care for their brood for a while.

Spiders have jointed bodies and legs. The bodies are divided into two regions, the anterior of these bearing four pairs of legs and two smaller pairs of appendages. The most anterior of these are the poison claws. They have a poison gland in the base, while the end of the claw tapers to a point. The front of the head has from six to eight simple eyes. The hinder half of the body, the abdomen, is without appendages, save for two or three pairs of very small projections, the spinnerets. Each of these has numbers of openings at the tip, through which a fluid is forced at will. This hardens immediately it comes in contack with the air and furnishes the silk of which the spider's web is woven. Fine as it is, this silk is really a cable, being made of numbers of finer threads, one for each opening in the spinnerets. They use the silk for making webs, for cocoons for the eggs, nests, and in some cases for parachutes for flying. Each species makes its own type of web.

Spiders breathe by means of sacks—so-called lungs—on the lower side of the abdomen.

Our common house spider is the same as that of Europe; the largest species we see is the one found occasionally in banana bunches.

The Tarantula has the greatest reputation from the unfounded belief that its bite causes madness which can be cured only by music. So far as is known there is only one species which can cause serious effects by biting man, and even these cases are not sufficiently authenticated.

The Bird Catching Spider is a gigantic spider native to Surinam and elsewhere. It preys upon insects and small birds, which it hunts for and pounces upon. It is about two inches long, very hairy, and almost black; its feet when spread out occupy a surface of nearly a foot in diameter.

Hunter-Spiders. A great many of this species construct no webs, but use their silk merely for lining their dwellings—which are commonly underground—or the construction of protective investments for the eggs. Such forms simply stalk their prey, seizing the victims, when near enough, by a sudden

spring. One such type is the tarantula spider described above.

Water Spiders are found in ponds and ditches in this country. They hunt down small crustaceans but do not construct a web. For the protection of the eggs a thimble-shaped nest is woven, moored by threads to stems or leaves, and smeared externally with liquid silk to make it watertight. The nest is filled with air brought down from the surface of the pond in successive bubbles adhering to the hairy body of the spider.

THE INSECTS (*Insecta*)

This ubiquitous class includes more species than all the other groups of land animals put together. The bodies consist of a series of rings, divided into three sections: the head, the thorax, and the abdomen. There is an external covering that serves as a protection. The head possesses a pair of antennæ, two large compound eyes (and sometimes several simple eyes as well), and three pairs of jaws, differing greatly in character according to the habits. The thorax bears three pairs of legs, and in most cases two pairs of wings, while the abdomen is entirely or practically limbless. The air-tubes make up an exceedingly complex system, and open to the exterior by a limited number of air-holes.

All insects undergo a series of changes (metamorphoses). From the egg first comes the larva (caterpillar, maggot); from the larva after several changes of the outer skin, the pupa is developed; from which, after a longer or shorter period of repose, the perfect insect emerges. In some, such as the dragon flies, the whole course of metamorphosis, or change, is not gone through; for in the dragon flies the larva which comes from the egg resembles the full-grown insect, only it is without wings; but later, without entering the pupa stage, it develops into the perfect insect. There are altogether about two hundred thousand various kinds of insects.

The simplest way of classification is into the following nine orders, though specialists recognize a much larger number: (1) Wingless insects (*Aptera*); (2) Straight-winged Insects (*Orthoptera*); (3) Bugs (*Hemiptera*); (4) Fringe-winged Insects (*Thysanoptera*); (5) Net-winged Insects (*Neuroptera*); (6) Beetles (*Coleoptera*); (7) Moths and Butterfies (*Lepidoptera*); (8) Flies (*Diptera*); (9) Membrane-winged Insects (*Hymenoptera*).

Beetles (*Coleoptera*).—These include an enormous host of insects. Their horny investment is particularly thick, and they possess strong biting jaws, though these differ in some respects from those described for the cockroach and its allies. The third pair, for instance are much more intimately fused together into a lower lip. The fore wings are modified into hard wing-covers, while the hind wings are membraneous, as in straight-winged insects (cockroaches, grasshoppers, and the like). But there is one marked difference between the two orders in regard to these organs. The hind wings of the latter fold up along a set of longitudinal pleats when they are tucked away under their covers, but in a beetle they are relatively long, and require a transverse fold as well.

The life history of beetles exhibits a well-marked metamorphosis. From the egg a grub hatches out, which, after a time, passes into a motionless pupa stage, and ultimately the investment of this splits open so that the perfect insect may emerge.

Beetles vary in size from a mere point to the bulk of a man's fist, the largest, the elephant beetle of South America, being four inches long. The so-called "black beetles" of kitchens and cellars are not properly beetles at all, but cockroaches.

The most interesting are the following:

Bombardier Beetle (*Brachinus crepitans*). This insect is preyed upon by larger beetles of its own family; but when chased, the bombardier ejects an acid fluid from glands situated at the tip of its tail. This acid immediately vaporizes on contact with the atmosphere, and looks like a tiny puff of smoke, while at the same time a distinct report is heard, reminding one of a miniature cannon. The discharge can be repeated several times in rapid succession, and prove very serviceable in keeping the enemy at bay until the little artilleryman is able to find shelter beneath a stone, or in a crevice of the soil.

Cantharis, a genus of blister-beetles, represented by the Spanish fly of Southern Europe. The insects are shaken with gloved hands from the branches of trees (ash, privet, lilac, elder, etc.), the gathering in the south of France taking place in May; they are usually killed in a hot vinegar solution and carefully dried. To retain their medicinal properties they must be kept in stoppered bottles. The blistering principle, or cantharidine, is so powerful that those who gather the insects are apt to suffer, and one-hundredth of a grain, placed on the lip, will raise blisters.

Firefly (*Elater*).—Some fireflies give forth a steady light, and these may be distinguished as fireflies proper from the glow-worms and "lightning-bugs," which flash light intermittently.

The most brilliant fireflies are a species most at home in tropical America. One form —*Pyrophorus noctilucus*—common in the West Indies and Brazil, attains a length of about one and one-half inches, and has a dark, rusty-brown color. On the upper surface of the first rings of the thorax are two yellowish oval spots, which are brilliantly luminous during the nocturnal activity of the beetle, while on the first ring of the abdomen a still brighter organ is situated. Even the eggs are luminous, and excized portions placed in a damp chamber remain functional for two or three days. The pounded debris of the insect is also luminous. The luminous organs are special modifications of the epidermic cells, which are disposed in two layers, of which the outer alone is luminous, while the inner contains masses of waste products, and is riddled by air tubes. The luminosity depends on a process of oxidation; the oxygen is supplied by the tracheæ, and the brilliancy varies with the breathing process of the insect. On the sleeping or entirely passive insect a soft light may be observed; the real light is only exhibited during active respiration, and may

SOME PICTURED MARVELS OF INSECT LIFE

A MOTHER EARWIG PROTECTING HER FAMILY (See Page 237)

CONTEST BETWEEN TWO MALE STAG-BEETLES FOR A MATE (See Page 234)

THE SEVEN SPOTTED LADY-BUG (See Page 234)

THE VICTORIOUS HERCULES BEETLE HAVING VANQUISHED HIS RIVALS IN COURTSHIP CARRIES OFF HIS MATE IN THIS FASHION. (See Page 234)

THE ENGLISH CRICKET
whose familiar chirp we have all heard in the late autumn (See Page 237)

THE BOMBARDIER BEETLE
is an expert artilleryman, and when pursued by an enemy is able successfully to resist the chase. (See Page 232)

be exaggerated experimentally by blowing in an extra supply of oxygen. Experiments seem to show that the fireflies utilize their phosphorescence to guide their steps.

Glow-worms (*Lampyrides*) are to be distinguished from the fireflies. They are nocturnal in habit, and represented by about five hundred species, widely distributed, especially in warm countries. America is very rich in "lightning-bugs," such as *Photuris pennsylvanicus*, and other species.

The luminous organs consist, like those of the fireflies, of fatty-looking cells round which there is a plentiful supply of tracheæ, affording the necessary oxygen for the rapid production of phosphorescence.

Professor Emery gives a most entertaining account of his observations on the love-lights of *Luciola italica*, which he studied in the meadows around Bologna, Italy. By catching females and imprisoning them in glass tubes in the meadows he satisfied himself that sight, not smell, was all important. When the females caught sight of the flashes of an approaching male, in spite of their tantalizing situation, they allowed their splendor to shine forth. The most noteworthy difference is that the luminous rhythm of the male is more rapid and the flashes briefer, while that of the female is more prolonged, at longer intervals, and more tremulous. The attracted males dance round about the female, who, after having captivated one suitor, proceeds to signal other rivals, till she is finally surrounded by a circle of devotees.

Ladybird or Ladybug (*Coccinella*) is a pretty little beetle, generally of a brilliant red or yellow color, with black, red, white or yellow spots. The form is nearly hemispherical, the under-surface flat, the thorax and head small, the antennæ and legs short. When handled they emit a yellowish fluid, with a disagreeable smell. Adults and larvæ feed chiefly on plant lice, and are thus most useful to hop-growers and other agriculturists. Ladybirds occasionally occur in immense numbers, and from ignorance of their usefulness have sometimes been regarded with superstitious dread.

Colorado Beetle (*Chrysomela*) is a North American beetle which commits fearful ravages among potatoes. It is an oval insect, of an orange color, with black spots and lines. The antennæ are club-shaped. The larvæ and adults live on the potato-plant, and have sometimes quite destroyed the crop in certain parts of the United States. They pass the winter underground, and emerge from their hiding-places in the beginning of May. The female lays many hundreds of eggs in groups of twelve to twenty on the under side of potato leaves. The larvæ, which emerge in about a week, are reddish and afterwards orange. They grow up quickly and produce a second generation, which may again produce a third in the same summer. Their rate of multiplication is therefore very rapid. The surest remedy in case of attack is said to be a preparation of arsenic known as "Paris Green."

Scarabæus (*Ateuchus sacer*), one of the dung-beetles well known for the zeal with which they unite in rolling balls of dung to their holes. The dung serves as food, and a beetle having secured a ball seems to gnaw at it continuously —sometimes for a fortnight—until the supply is exhausted. Sometimes an egg is laid in the ball, and the parents unite in rolling this to a place of safety. There are numerous American species.

By the Egyptians the scarabæus was venerated during its life, and often embalmed after death. Entomologists have recognized four distinct species sculptured on the Egyptian monuments, and gems of various kinds of stones were often fashioned in their image.

Stag-beetles (*Lucanus*) are nearly allied to the scarabees. The males are remarkable for the large size of their mandibles, the branching of which has suggested stags' antlers. The common stag-beetle is a large formidable-looking insect, the males being fully two inches long, and able to give a sharp bite with their strong mandibles. It flies about in the evening in the middle of summer, chiefly frequenting oak-woods.

These insects habitually are well known to fight for possession of a coveted mate. For this purpose the mandibles of the male are enormously developed, and frequently there occurs a most amusing tussle, one beetle striving to gain the side of his lady-love, the other balking him. Eventually one suitor admits defeat by turning tail and making off, while the victor marches in triumph to the fair cause of all the trouble, and begins to court her.

The huge Hercules Beetle of South America has been seen to carry off his mate bodily in this way. Other tropical beetles have specially developed forelegs for grasping their spouse, should she prove coy and attempt playfully to run away.

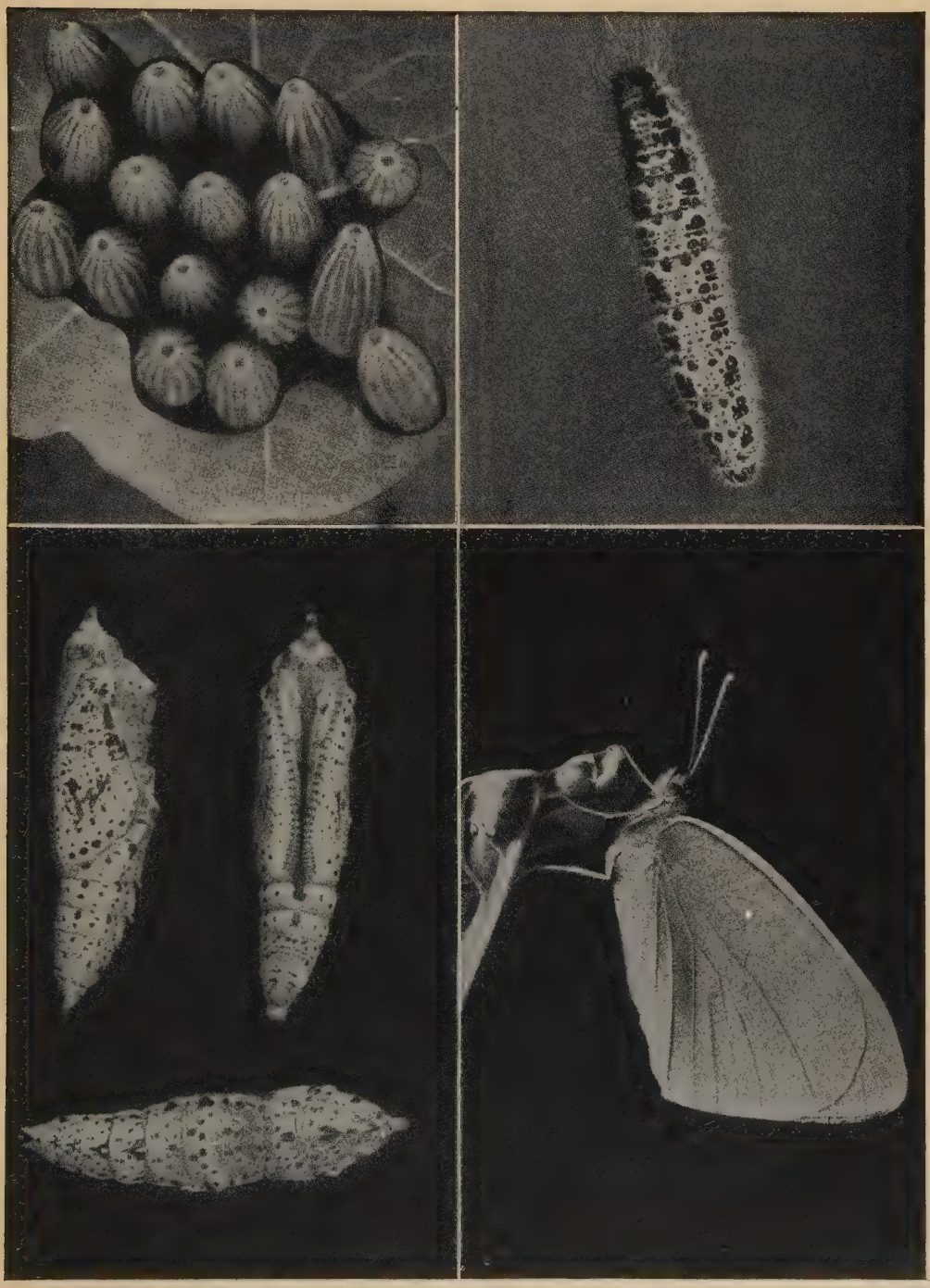
Water-beetles (*Dilisscus marginalis*) are carnivorous types which have become adapted to life in fresh water, although the adults have not lost the power of flight. In our native great water-beetle the large hind legs are fringed with bristles, and serve as oars, while air can be stored under the wing-covers. There is only a partial metamorphosis.

Weevil is a popular name for a large number of beetles, marked by a beak or proboscis, generally used by both sexes as a boring organ. Among ten thousand described species are the American species *Trichobaris trinotata*, a small black weevil which destroys potatoes, and *Conotrachelus nenuphar*, which lays its eggs in various fruits and is a great pest, and the *Entimus imperialis*, the diamond-beetle with very brilliant scales.

Wire-worms are the grubs of skip-jack or click beetles, perhaps the most injurious of farm pests. They are called wire-worms "from their likeness in toughness and shape to a piece of wire;" they are yellowish in color, from one-quarter to one-half an inch in length, with three pairs of legs, and a suctorial appendage below the tail. The eggs are laid near the roots of plants, in the ground or in the axils of leaves; the grub remains for several years (three to five) as such, burrowing in the ground during the frost of winter, but at other times hardly ceasing from voracious attacks on the roots and underground stems of all sorts of crops. Dressing of lime, salt, nitrate

THE LIFE HISTORY OF A BEAUTIFUL BUTTERFLY

ITS STORY IS VERY SIMILAR TO THAT OF THE SILKWORM



In these photographs the transformations of a butterfly are shown: the butterfly's eggs (highly magnified) laid upon a leaf; the newly hatched caterpillar; and a caterpillar which has finished its growth and has spun a silken pad, to which as a chrysalis it may cling. The chrysalis is also shown, and the newly emerged butterfly waiting for its wings to expand fully and harden. All the figures are enlarged.

of soda, etc., have been recommended as remedies.

BUTTERFLIES AND MOTHS (*Lepidoptera*)

These are among the highest orders of insects. For beauty and variety of coloration they are quite unrivaled, and their attractive appearance is primarily due to the fact that the four wings are covered with overlapping scales of different kinds. The mouth parts are specialized to constitute a suctorial organ, which is made up of the second jaws, while the first and third jaws are greatly reduced. Each second jaw has become a half-tube, and the two are hooked together to make up a proboscis, sometimes of great length, which can be separated into its halves.

How Butterflies Develop

The life-history exhibits a very typical and familiar metamorphosis. From the egg, which is often very beautifully sculptured, a larva known as a caterpillar hatches out, possessing not only the three pairs of jointed legs characteristic of the class, but also a varying number of unjointed pro-legs terminating in suckers. After feeding voraciously for some time by means of its powerful biting first jaws, and undergoing a number of moults, the caterpillar passes into the motionless pupa stage, here called a chrysalis, which may or may not be invested in a protective cocoon. The skin of the chrysalis ultimately splits, and the perfect insect makes it way out.

How to Distinguish Butterflies from Moths

Butterflies are typically distinguished from moths by the club-shaped thickenings at the ends of their antennæ, and by the fact that when settling, the wings are folded together over the back. In moths the antennae may be of various form, but very rarely club-shaped, and the rest-position of the wings is horizontal or sloping downward, while in some instances they may be more or less wrapped round the body.

Why Butterflies and Moths Have Beautiful Colors

Some butterflies are dingy, others uniform, but in contrast to moths the majority are beautifully colored. This is especially the case with tropical forms. How the colors are variegated and contrasted in spots and bands, how the hues are embellished by metallic shimmer, every one knows; what exactly the color means is, however, still obscure. A few general facts may be first noticed: (1) The color is in many cases subject to variation—it cannot be said to be absolutely constant for a species; (2) in some instances, at any rate, it is influenced by external conditions, for different forms at different periods of the year, is known in many kinds; (3) sometimes the color and markings, especially of the under surface of the wings, are obviously of use for the protection of the resting butterfly; (4) in some cases this protective adaptation is so pronounced as to deserve to be called mimicry; (5) in many cases the coloring is in direct connection with the physical constitution of the species, and is usually most marked in the males.

Chief Classes of Butterflies

Of the families representing more than five thousand species, the chief are the following:

(1) *Nymphalidæ*, the largest, containing between four and five thousand species. They have a relatively simple type of coloration, and are interesting because of their disposition to mimic other species. They are distasteful to birds. They include the red admiral, the tortoise-shells, the peacock, and so on, as well as the fritillaries and the purple emperor. In it are also included the remarkable leaf butterflies in which the under surface, in shape, color and markings, closely resemble a dead leaf, while the upper surface is brightly colored. On alighting only the under surface is visible.

(2) The *Erycinidæ* is represented by the Duke of Burgundy fritillary.

(3) The *Lycænidæ* include the "blues," so commonly seen flitting near the ground along muddy roads, so called from the color of the upper surface, but many are also copper, white and yellow.

(4) The *Pieridae* include the white cabbage butterflies. They are remarkable for the prevalence of white, yellow, and orange colors, and for the fact that these tints are due to uric acid, or derivatives of this substance, stored in the wings as a pigment.

(5) The *Papilionidæ*, or swallow-tails, contain perhaps the most beautiful forms. The females are strikingly different from the males, and though larger, do not display the same beauty of coloration. The members of the family are widely distributed.

(6) The family *Hesperidæ*, or skippers, includes insects very different from other butterflies, both in structure and habits. The adults have in many cases a very rapid but jerky method of flight, and the larvæ in their habits resemble moths rather than butterflies.

Moths (*Heterocera*).—The antennæ of moths are bristly, gradually lessening from base to tip; when sitting the wings are turned down; and its flight is nocturnal. What the owl is among birds, the moth is among insects: it is a night-insect, carrying on its pursuits, and exercising all its activity amid the gloom of darkness. So numerous is the variety of moths, that there are upward of five hundred species.

The giant Owl-Moth of Brazil (*Thysania agrippina*) measures nearly a foot across from tip to tip of expanded wings, while the smallest are hardly visible to unaided eyes. The larvæ or caterpillars feed mostly on living plants, and in this connection are very familiar; others of these ravaging forms ruin clothes, furs, and the like. Almost the only directly useful form is the silk-moth.

Silkworm Moth. See under Domesticated Animals.

STRAIGHT-WINGED INSECTS (*Orthoptera*)

The fore wings are either parchment-like or membraneous; the hind wings always membraneous. The wings cover the body horizontally, and do not meet in a straight line or ridge, as they do in the beetles. This order of insects undergos only a partial metamorphosis, being produced from eggs in a wingless condition. The Cicadas, however, are an exception,

as they live in the ground frequently for years in the larva state. In this order are included the locust, cricket, grasshopper, cockroach, scale insect, plant-lice, and many kinds of bugs.

Crickets (*Gryllus*) are akin to grasshoppers. They have long feelers, a rasping organ on the wing-covers of the males, wings closely folded lengthwise, but often along with the wing-covers degenerate, great powers of leaping, and a retiring, more or less subterranean habit of life. Many of the species are wingless, and it is the males only which make a chirping sound. They are widely distributed, and all are herbivorous. The field cricket, house cricket and the common mole-cricket, are well-known representatives of the family.

Earwigs (*Forficula*) have two pairs of wings, very dissimilar, the anterior pair being short and horny, the posterior pair folded longitudinally and transversely; the mouth parts are well developed and suited for biting; the antennae are thread-like; there is no true metamorphosis in the life-history. The common earwig is best known for the pincer-like organ at the end of the abdomen.

Earwigs avoid the light, and do most of their work in the dark. They feed, as gardeners well know, on petals and other parts of flowers, on fruit, seeds and leaves, nor is animal debris refused. They are usually and readily caught in artificial shelters provided for their destruction.

The eggs of the common species are laid in spring, fifteen to twenty, in some convenient cavity. These are carefully watched, and even after the birth of the young earwigs, the mother still tends them as a hen does her chicks.

Grasshopper, a name given to numerous insects forming the locust family. They usually live among vegetation, in woods and thickets or in the open field. Most of them feed on flies and caterpillars, in catching which they use their powerful fore-legs, but many affect plants, and some combine both diets.

In the grasshopper the head is placed vertically; the slender antennae are longer than the body; there are hemispherical eyes, but rarely eye-spots; wings and wing-covers are generally present. The right (and occasionally also the left) wing-cover of the male bears a clear, round membrane stretched on a ring, which produces the well-known "chirp" when set in vibration.

The females have a long egg-positor. The eggs are laid by means of it either in the earth or in some dry stem. From these, in spring, larvæ are developed, which are virtually like the adults, but molt at least six times before they become full-grown.

Katydid, a name applied to numerous American insects, nearly related to grasshoppers. They frequent trees, shrubbery, and grass, and are well concealed in the foliage by their green color. In their general habit, *e. g.* in the song to which the syllables "kat-y-did" refer, and in the egg-laying accomplished by the long egg-positors of the female, these lively insects resemble grasshoppers.

Locusts (*Acrididae*) are large, ground-loving insects, of world-wide distribution, famous for their voracious vegetarian appetite. In size they vary from one-quarter inch to five inches in length. They have strong hind-legs with great leaping powers, large heads with formidable mouth-organs, shorter antennæ and robuster bodies than grasshoppers. Both winged and wingless forms occur, the former with strong powers of flight. The females have strong egg-positors by which they bore holes for their eggs. The numerous eggs are laid in holes drilled in the ground; the young when hatched generally resemble the parents except in the absence of wings. From the first they are gregarious, and excessively voracious except during their repeated molts; they devour all green things, and even one another, and are often forced by stress of hunger and excessive multiplication to migrate in great swarms.

Their ravages sometimes cause widespread famine and ruin. One of the most famous and destructive forms is the Rocky Mountain Locust (*Caloptenus spretus*); the most abun-

On the left is shown a Leaf Insect which, having given up the habit of flight, has yet retained its likeness to the leaves upon which it feeds to protect itself from its enemies. On the right is shown a grasshopper depositing her eggs in a nest under the ground. (See above).

dant migratory species of the East, so often mentioned in the Scriptures, is *Pachytylus migratorius.*

ANTS, BEES AND WASPS (*Hymenoptera*)

These membrane-winged insects are the most intelligent of their kind. They are readily recognized by the presence of four transparent wings traversed by a comparatively small number of veins, the hinder ones being much smaller than the others, to which they are in many instances attached during flight by means of a row of minute hooks. The posterior end of the body in the female is commonly provided with a piercing apparatus, which may either serve for boring holes, in which eggs are laid, in which case it is called an "ovipositor," or may have been modified into a poisoned sting, useful for offense and defense. The black and yellow or black and red bands of wasps and bees are "warning colors," indicating their stinging powers.

The larvæ either resemble caterpillars or are pale, helpless maggots, devoid of limbs, for the welfare of which more or less elaborate provisions are made by the mother insect. Later on a pupa stage is reached, from which the winged adult ultimately emerges. The highest members of the order live in communities comprising several casts.

Ants (*Formicidae*).—These familiar and intelligent diminutive creatures are perhaps the most interesting of all insects, owing to the extraordinary way in which they have become adapted to a great variety of modes of life. All are social, and a community typically consists of males, females, workers (of one or more kinds), and, it may be, soldiers. The first two are generally provided with wings, though those of the females are soon shed, but exceptions to this occur, and some species may have both winged and wingless individuals of one sex or the other. The first pair of jaws (mandibles) are well or even excessively developed, and possess unusually free powers of movement in accordance with the varied functions they have to perform. In many cases the females (including the workers) are provided with a sting.

Ants hatch out as helpless, limbless larvæ, which have to be fed and carefully attended, either by the fertile females or the workers, as the case may be. Feeding is rather a curious affair, for the nurse possesses a sort of pouch (crop) connected with her gullet, and this is used as a store from which nutriment can be squeezed up into the mouth. Adults can feed one another in the same way, as also the little beetles and other insects which are often found as guests in their communities.

WANDERING ANTS OF THE TROPICS

These ants are of highly carnivorous habits, and move about in large armies, devouring everything of animal nature that comes in their way. The fact that they are blind, or practically so, does not seem to interfere with their devastations. Some of the forms are common in the hotter parts of South America, while others, the "driver" ants, are well known in Africa, where criminals, it is said, are sometimes tied up in their path, to perish miserably, if speedily.

SLAVE-HOLDING ANTS AND THEIR SLAVES

Some ants press weaker species of their kind into unmerited captivity. In one familiar instance the relatively large oppressor (*Polyergus rufescens*) is of reddish color and well endowed in the matter of jaws, while the enslaved species (*Formica fusca*) is small and dark. Regular slave raids are made from time to time, when, after stubborn resistance, the pupæ and older larvæ of the weaker form are carried away to lead a life of bondage, to which, indeed, they take very kindly. This kind of social economy has indeed become an absolute necessity to the slavers, which have quite lost the power of feeding their own young, while some such species cannot feed themselves.

A most extraordinary state of things occurs in the case of a small kind of ant (*Anergates*) which possesses no workers of its own, but lives within the communities of another species (*Tetramorium cæspitosum*) entirely made up of workers.

Some ants, such as the little black species (*Iasius niger*) common in gardens, use as part of their food a sweet fluid that exudes from plant lice (*aphides*), and keep these insects as we keep kine. The captives are fed, sheltered, and jealously guarded. Fenced enclosures are constructed for them on plants in the vicinity of the nest, with which they are connected by covered roads. During winter the fragile eggs of the plant lice are taken underground and sedulously cared for.

THE HARVESTER ANTS OF EUROPE, NORTH AFRICA AND NORTH AMERICA

A number of ants are known that construct extensive underground dwellings, in which they store seeds of various kinds. Some of the American species (*Pogonomyrmex*) may be even said to winnow their grain, for they carefully strip off the husks and deposit these on rubbish-heaps outside the nest.

Some of the seed-storing ants almost deserve the name of maltsters on account of the way they deal with their harvest. The human method of making malt is to allow the barley grains to germinate to a certain extent until the contained starch is converted into malt-sugar, when the process is arrested by scalding. In similar fashion ants permit germination to go on to a certain point, and then kill the seedlings by biting away the little shoots and roots. In this way a supply of the sweet food they love is secured.

Among the most interesting of ants are leaf-cutting forms (*Atta*) native to tropical America. They are associated in huge communities occupying complex underground dwellings, the sides of which are marked by mounds that may measure as much as forty yards round. The chief food consists of a kind of fungus (*Rozites gongylophora*), cultivated on bits of leaf, and treated in such a way that little white elevations are produced. It is these that the ants desire.

The chief duty of one set of workers is to collect the pieces of leaf required. To facilitate their operations, roads, largely underground, are constructed, which lead to suitable trees, and may be as much as twenty yards long, or more. Curved pieces of leaf are bitten out and carried back to the nest, where they are handed over to

another set of workers, by them to be reduced to smaller fragments and made into mushroom beds.

WHERE AND HOW THE HOMES OF ANTS ARE BUILT

Ants live in dwellings of the most varied kind, many being underground. In a large number of species ant-hills are constructed of various loose materials, our common native wood-ant (*Formica rufa*) being a good example of this. An Asiatic ant (*Oecophylla*) constructs a summer-house of leaves in a curious fashion. The larva possesses silk-glands from which a sticky fluid exudes, hardening quickly on exposure to the air. Advantage of this is taken by the workers, for they hold larvæ in their jaws, and employ them as living gum-bottles, while the leaf-edges to be cemented are held in position by other workers.

Some South American ants construct hanging nests in trees, by which protection against floods is secured. Other ants in the same part of the world make curious homes which well deserve the name of "hanging gardens," for they are mainly constructed of living plants, some of which have never been found in any other situation. The plants are cultivated and tended by the ants with which they are associated. The soldiers of certain ants (*Colobopsis*), which tunnel out homes in the wood of trees, play the part of living front doors. Every entrance to the nest is guarded by one of these hall-porters, its huge head not only exactly filling the aperture, but closely resembling the adjacent bark in appearance. If this curious door be touched by a bit of stick or a feather, it remains shut, but is immediately opened when stroked by the antennæ of a worker.

CURIOUS ANT GUESTS AND ASSOCIATES

Not only may ants of two or more kinds be associated together in the same dwelling, but a nest may also be tenanted by peculiar species of beetles (and other insects), spiders, mites, or other creatures. Many of these, especially the beetles, are fed and cared for by the ants, some of them for the sake of a substance which exudes from their bodies; others, perhaps, to serve as pets. The beetle-grubs are looked after as well as the adults; at least in the case of certain blind species.

On the other hand, certain ant-beetles not only steal food from the ants, but also devour their young. There can be no doubt that these curious associations are very ancient ones, for many species of beetles are found nowhere else. A kind of bristle-tail that lives in ant's nests is a thief pure and simple. It has been seen to steal the drops of honey being passed from the mouth of one worker to another, afterwards retreating at full speed.

The common red ant (*Myrmica rubra*) shelters and feeds a curious kind of blind mite, which lives on the bodies of its hosts. By stroking its entertainers with its legs it makes known its need of nutriment, and such requests are never refused. Not impossibly some return may be made for these good offices.

One of the Indian ants (*Sima rufo-nigra*) lives on the bark of trees with a species of wasp (*Rhinopsis ruficornis*) and a kind of spider (*Salticus*), both of which closely resemble it in appearance. The three associates appear to be good friends, while wasp and ant sometimes engage in a friendly wrestle.

AN ANT AT ITS MORNING TOILET

A remarkable observation made by a student of insect life while examining ants under the microscope.

HOW ANTS COMMUNICATE WITH ONE ANOTHER

The complex life of an ants' nest is a striking instance of order among apparent disorder. Each of the innumerable individuals discharges its special tasks without hesitation, unless unusual circumstances prove a hindrance. It would seem, therefore, that there must be some means by which any one can convey information to others. When two meet they frequently stroke one another with their feelers, and this perhaps serves the purpose of language.

THEIR REMARKABLE HABITS OF CLEANLINESS

Some wonderful facts are recorded concerning matters of personal cleanliness among ants, and has shown incidentally that these insects perform amazing feats of acrobatic skill without the least effort, and quite as matters of course. For example, an ant will often hang from a grass stem by the claws of one leg, while it combs its antennæ, cleanses its five remaining feet, or bends its head upwards to lick its abdomen and furbish the joints of its armor. Indeed, thanks partly to the wonderful flexibility of its "waist," and still more to the tenacity of its muscles, an ant is able to assume and maintain almost any position that the need or fancy of the moment may prompt.

Many stingless ants, when fighting, first bite their adversary with their jaws, and then

bringing the tip of the abdomen beneath the body, squirt formic acid into the wound.

Bees.—See Domesticated Animals.

Bumble-bees.—These common bees are large, somewhat clumsy-looking insects which live in communities including workers or imperfect females as well as ordinary members of the two sexes. The nests are constructed in holes in the ground or other sheltered places, and the establishment of a community is due in the first instance to the labors of a queen in early summer. She makes a number of waxen cells, stores them with honey and pollen, and afterwards feeds the larvæ when they have devoured these provisions. From the first (and several other), batches of larvæ workers are chiefly produced, which undertake the constructive and nursing work, until at last the queen has nothing to do but lay eggs. Males and other queens are reared from some of the eggs laid in late summer and early autumn.

Wasps, like bees, are either solitary or social, and it is only in the latter that workers exist. Solitary wasps construct small nests of clay and little stones, or else make burrows. They possess the curious habit of storing up immature—for example, caterpillars—or mature insects, or even spiders, for the benefit of their larvæ when these hatch out. The kind of victim depends upon the species of the wasp concerned, but in any case it is killed or paralysed by stinging.

Social wasps somewhat resemble social bees in their habits, but their building material, instead of being wax, is a kind of paper made of chewed wood mixed up with saliva. In some instances the nest is suspended from a bush or tree, and is provided with a kind of overhanging roof by which rain is drained off.

In our commonest species, an underground site is chosen, and a series of combs constructed from above downward, the whole being enclosed in several layers of wasp paper. Adjacent combs are held together by little pillars. The young are at first fed upon fruit-juice, nectar, and other vegetable matter, for which a more stimulating diet of chewed insects is afterwards substituted.

The Hornet (*Vespa crabro*) is a social wasp which commonly nests in hollow trees or constructs elaborate nests out of wood fibers, suspended from boughs. The females have formidable retractile stings. The hornet is represented in the United States by the white-faced hornet (*V. maculata*), also a large species.

FLIES (*Diptera*)

There are some thirty or forty thousand species of flies known, while no other order has so many individuals as this. This enormous assemblage of insects, most of which are small or even minute, includes many species that have earned an undesirable reputation as blood-suckers and pests. Except in fleas and a few others, such as sheep-ticks, there are two membraneous front wings, the hinder pair serving as sensory structures. The mouthparts of the female are very often piercing and sucking organs of great efficiency, the first and second jaws being in the form of slender lancets protected above and below by the upper and under lip respectively.

But in other types, such as the house-fly (*Musca domestica*), the jaws are modified into a proboscis used for sucking juices, and devoid of powers of perforation.

THEIR UNCLEANLY AND DEATH-CARRYING HABITS

This fly lays its eggs in manure or other refuse, these hatching out, passing through all their stages and emerging as perfect insects in a few days. Their uncleanly habits make the house flies most efficient agents in the carriage of different diseases, especially typhoid fever and others which attack the digestive tract. Flies are therefore not merely a nuisance to be deplored, but a positive danger to mankind. Among other flies are the carrion flies, black flies, the gnats and the mosquitoes, all troublesome to man, while others attack various plants.

THE LARGE VORACIOUS FLEAS

Of these the breeze-flies or gad-flies possess powerful piercing mouth-parts, with which they torment both stock and human beings. A well-known species is the long brown clegg (*Hæmatopota pluvialis*), often met with in woods. In some tropical kinds the jaws are of enormous length.

Robber-flies are voracious and insatiable forms which prey upon other insects, even wasps and tiger-beetles being among their victims.

Hover-flies are swift and elegant insects which have already been mentioned in connection with flowers. Some of them closely resemble bees in appearance.

The dreaded tsetse fly (*Glossina morsitans*), so fatal to horses in parts of South Africa, belongs here. Germs of the fly-sickness (*Nagana*) are introduced into the blood of the victims, Tsetse flies of other species are responsible for "sleeping sickness," which makes parts of tropical Africa uninhabitable.

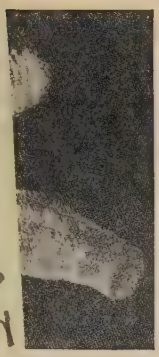
THE PESTIFEROUS MOSQUITOS AND GNATS

These are particularly notable for the blood-sucking propensities of the female. Some tropical mosquitoes disseminate the germs of such diseases as malarial fever. Wholesale destruction of the early stages, by pouring petroleum on the surface of the stagnant water in which they live, has been employed with conspicuous success at Havana and in the Panama Canal zone as a preventive measure against yellow fever and malaria.

Midges are very minute gnats, of which the aquatic larvæ are known as blood-worms.

THE WINGLESS FLEAS AND OTHER PESTS

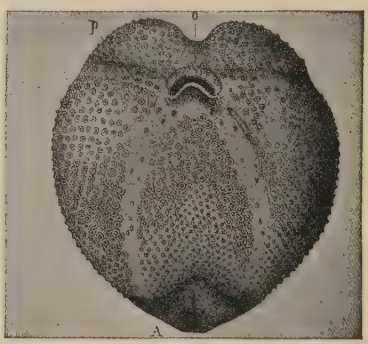
Fleas are wingless members of the order, and their agility fully compensates for the loss of the power of flight. There are many species, infesting different mammals and birds. The females of the tiny sand-fleas, or chiggers (*Sarcopsylla penetrans*), of America deposit their eggs in the feet of human beings (or other animals), and unless the painful swellings thus brought about are carefully treated they are apt to fester dangerously.



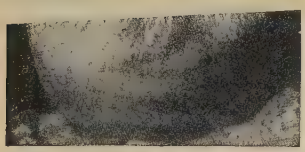
242)

SURFACE OF STARFISH (See Page 242)

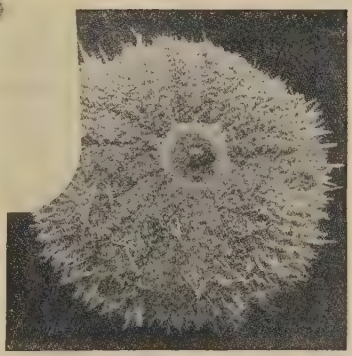
JELLY-FISH (Page 243)



HEART-SHAPED SEA URCHIN (See Page 242)



SEA ANEMONE (See Page 243)



SEA URCHIN (See Page 242)

BRANCHING CORAL (Page 243)

STARFISHES AND SEA-URCHINS (*Echinoderms*)

HEDGEHOG SKINNED ANIMALS OF THE SEA. SEA-LILIES, STAR FISHES, BRITTLE STARS, SEA URCHINS, AND SEA CUCUMBERS

ECHINODERMS, or hedgehog-skinned animals differ from all the forms so far considered in the nature of their symmetry. Instead of being two-sided, with a well-marked distinction between right and left and front and back (bilateral symmetry), they resemble a star or regular flower in shape. The skin is hardened by the deposition of salts of lime, and the body is often covered with spines, as more particularly in sea urchins.

Five existing subdivisions are recognized: (1) Sea-lilies and feather-stars (*Crinoidea*); (2) Starfishes (*Asteroidea*); (3) Brittle Stars (*Ophiuroidea*); (4) Sea urchins (*Echinoidea*); and (5) Sea-cucumbers (*Holothuroidea*). All are marine.

Sea Cucumbers are sort of second cousins to the sea urchins and rather more distantly related to the starfish. As the name indicates, they are shaped like a cucumber, and hundreds of little feet on the side heighten the resemblance, as they recall the spines on the vegetable. Inside they have a coiled intestine, usually filled with mud and the contained vegetable and other debris. With us no use is made of the animals, but they are taken in great numbers in the South Seas, and sent to China, where, as trepang, they form an ingredient in soups.

Sea-lilies are deep-sea animals, once numerous and flourishing, but now comparatively rare, and only to be obtained by dredging in the deeper parts of the ocean. They are fixed by a long, jointed stalk bearing circlets of sensitive threads and terminating in a cup, in the center of which the mouth is situated. Radiating from the edges of the cup are five branching, feather-like arms, all of which are grooved above, the grooves uniting, and finally converging to the mouth. They are beset with cilia, and minute organisms are conducted inward along them to serve as food.

Sea Urchins are radiated animals which are usually shaped like a flattened sphere. They have a mouth, surrounded by five chisel-shaped jaws at one pole, while the whole outer surface is covered with slender, movable spines. Between the spines are numbers of slender, flexible, tubular feet, which pull the body along, while the spines act more like true feet. The animals feed mostly on seaweeds. They have no economic value with us, but in Europe the eggs of some species are eaten, forming part of the *frutti di mare* of every Italian seaport.

Starfishes.—Starfishes are among the most familiar objects of the seashore, and the commonest kinds, such as the five-finger (*Asterias rubens*) and the comb-star (*Astropecten aurantiacus*) possess five radiating arms. The mouth is in the center of the under side, and leads into a capacious stomach, of which the first part can be protruded from the body to surround such prey as mussels and oysters.

A starfish crawls slowly by means of numerous tube-feet, which are lodged in five grooves radiating from the mouth, and make up a part of the water-vascular system, so called because it is full of sea-water. At the end of each arm is an unpaired tube-foot acting as a feeler, while on its under side there is an orange-red eye-spot.

The water-vascular system assists in breathing. It was probably first evolved in the interests of respiration, and this is its chief use in the sea-lily. Some of the spines are formed of little, two-bladed pincers, which clean the surface of the body.

Starfishes are remarkable for their powers of restoring lost parts. A detached arm can grow a fresh disc and another four arms.

ANIMALS THAT APPROACH THE SIMPLEST FORMS OF LIFE

WORMS, LEECHES, SEA-ANEMONES, CORAL-POLYPS, JELLY-FISHES, SPONGES

SEVERAL groups of the lower animals are collectively known as Worms, though most of these groups are but remotely related. Ringed worms are elongated creatures in which the body is made up of a considerable number of rings or segments, most of which are, on the whole, much alike. There is often a well-marked head, but no distinct thorax and abdomen, as in an insect or crayfish. Two subdivisions are recognized: (a) Bristle-worms (*Chætopoda*) and (b) Leeches (*Discophora*).

Bristle-worms include a host of marine worms, together with some that live in fresh water, and also the earthworms. Their average characters are best understood by examining one of the commonest shore-worms, known as the sea-centipede (*Nereis*). Here the segments are very clearly seen, and almost every one of them bears a pair of unjointed conical foot-stumps, used for crawling.

Imbedded in the foot-stumps of the sea-centipede are bundles of strong bristles, which give a hold on the underlying surface and prevent slipping. The head-region is fairly distinct, and bears a number of feelers of various kinds, as well as four simple eyes. Sea-centipedes and many of their allies are highly carnivorous, and seize their prey by means of a pair of horny jaws which can be protruded at will.

Earthworms are found in all parts of the world, though naturally they do not thrive in arid tracts; and their effect upon the fertility and drainage of the soil can hardly be calculated. Burrowing into the ground, they cast up the earth they have swallowed, and so pursue a constant and thorough system of ploughing. Though eyeless, they evade the light and only come out of their burrows at dusk, often remaining, even then, with their tails in the holes and their bodies working round and round.

Darwin long since demonstrated, the earthworm is one of the farmers' best friends. Its burrows drain and aerate the soil, while the earth which has passed through its body is finely divided and constantly being brought to the surface from lower levels.

Not far from the front end of an earthworm a thickening will be seen, often erroneously supposed to be the result of injury. From it exudes a fluid which hardens into the egg-cases.

Leeches live in the sea, fresh water, or even in damp, tropical forests. The flattened body of the leech is divided by grooves into a number of narrow parts, several of which go to make up a segment. Foot-stumps and bristles are entirely absent, and progression is effected by means of suckers, one at each end. They effect a looping movement, but the animal can also swim by undulations of its body. The freshwater leech is a bloodsucking parasite. The mouth is situated in the middle of the front sucker, which serves to fix the animal to its victim. Three saw-edged jaws are then brought into play, a three-rayed cut being made, and a fluid poured out which prevents the blood from clotting. Digestion is slow, and the food is stored in a large crop, drawn

out into numerous pairs of pouches. The head possesses eye-spots, but no feelers.

ANIMALS LIKE PLANTS (*Cœlenterata*) of which sea-anemones, corals, and jelly-fishes are examples, are distinguished by the ray-like symmetry of starfishes and their kind, though here, as a rule, it is more perfect. In structure they are much simpler, than any of the animals so far considered. For such a creature is to all intents and purposes simply a stomach, the wall of which is made up of two layers of cells, one (*ectoderm*) external, and the other (*endoderm*) internal. In higher animals a third layer (*mesoderm*) is interposed.

Sea Anemones are common between tides and lower on all coasts. They are cylindrical animals, with a mouth surrounded by tentacles at one end. Inside there is a single cavity which serves as a stomach and whose branches run to all parts of the body, thus distributing the food like a blood vessel. The colors, especially in the tropics, are variable, and often gorgeous.

Coral-polyps are closely related to sea-anemones, but differ from them by secreting a hard, limy skeleton in the base of the body. They are either simple or compound. The well-known mushroom coral may be taken as an example of the former. Its skeleton is a shallow cup, exhibiting numerous radiating plates. If we look at the upper surface of such a coral in the living state we shall see a mouth surrounded by circlets of tentacles, much as in a sea-anemone.

A compound coral consists of a number of individuals, relatively small in size, connected together by a common flesh, and formed by the budding or splitting of a single original polyp, the results of the process remaining united.

Many corals branch, while others form compact masses, as in the kind above described, and also in the brain coral, where the boundaries between the individuals are not clearly marked.

Corals are widely distributed, some living even in cold latitudes, and others on the floor of the deep sea. Coral reefs, however, made up of the skeletons of such animals, are only found in the warmer parts of the ocean, where the water is clear, particularly favorable conditions being afforded by the Pacific and Indian Oceans. (See also Coral Reefs and Islands).

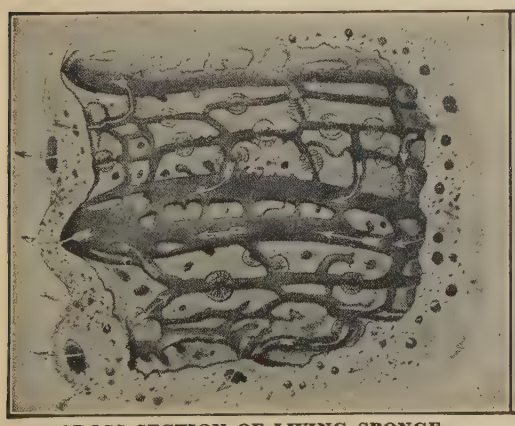
Jelly-fish (*Medusæ*).—All agree in having a more or less bell or umbrella shaped body, with a proboscis hanging down in the place of the handle of the umbrella or the tongue of the bell. The mouth is at the end of the handle and leads into a stomach which divides and sends out branches, like the ribs of the umbrella, to the margin. The common name is due to its gelatinous consistency. Most of the species start in life as buds from attached animals, which later separate and henceforth lead a free existence, swimming by opening and closing the bell.

SPONGES (*Porifera*) are animals of peculiar structure, which resemble zoophytes in many respects, but possess neither tentacles not thread-cells. Some are simple, but most of them are compound. A simple sponge may be compared to a cup or vase with a wall perforated by numerous small holes, through which currents of sea-water stream into the central cavity, to make their exit by the main opening. They are set up by ciliary action.

Venus Flower-basket.—In the majority of cases the skeleton of a sponge is mostly or entirely made up of sharp needles of lime or flint, which may be welded together, as in this form. Often the opening of the vase is provided with a convex perforated covering. Another elegant form is the Glassrope Sponge native to the Japanese seas. It is rooted in the mud by a bundle of long, glassy spicules, which are slightly twisted.

Most sponges are marine, and, despite their fixed habit and apparent helplessness, are pretty free from the attacks of most other creatures, partly because of the innumerable sharp spicules they contain, and partly because their taste and smell are unpleasant. These deterrent qualities are often associated with bright warning colors, generally red, yellow or orange.

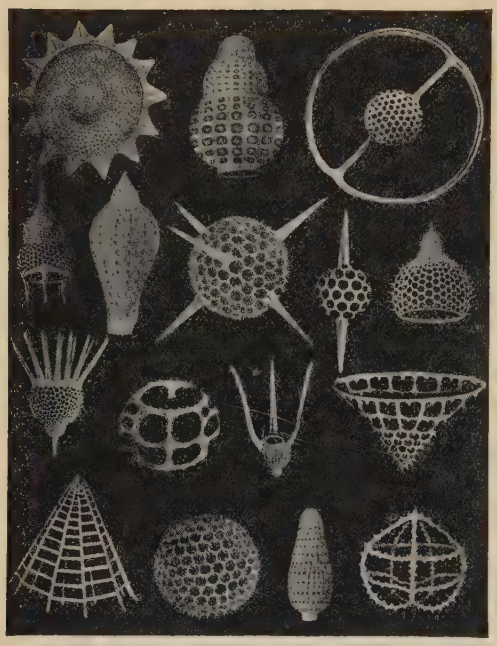
Most of us little realize that the sponges we see or use daily are in reality dead animals.



CROSS-SECTION OF LIVING SPONGE

THE SPONGE IN ACTION

The arrows show how the water enters by the small pores, to pass out by the large openings. Food is thus brought to the cells which line the channels. At the right the currents of water are seen passing from the outer openings, as seen under a powerful microscope.



THE BORDER-LINE BETWEEN ANIMAL AND PLANT LIFE

On the left are represented highly magnified animal skeletons of a class of Protozoa called Radiolarians. Most of them are under one-twenty-fifth of an inch in size. Millions upon millions of these little shells are found upon the floors of the ocean, and upon its shores. They are marvels of form and color—so wonderful, indeed, that man with all his skill cannot imitate them. When alive they consist of but a single cell, and live in colonies with the *plant* forms, called algæ, pictured on the right. The algæ are also single-celled, and of rare beauty of form, and the strange association of the simplest of *animal* forms with the simplest of *plant* forms has up to the present time proved the supreme enigma of science.

PROTOZOA OR SIMPLEST FORMS OF ANIMAL LIFE

ANIMALCULES, AMOEBA, RADIOLARIA, FLAGELLATES, CILIATES

ANIMALCULES (*Protozoa*)

In botany we find that the lowest plants are mostly of a microscopic size, and *unicellular*—that is, consisting of a single cell or structural unit, essentially a fragment of living matter (protoplasm), part of which is specialized into a nucleus. The lowest animals are also unicellular, and the popular term "animalcule"—a little animal—has reference to their diminutive size. One of the simplest known cases is afforded by the

Amœba (*Gr.* "change"), a name given to a number of the simplest animals or protozoa. The simplest form which the observer will meet is a naked lump of jelly-like protoplasm constantly flowing into new shapes.

Ray Animalcules (*Radiolaria*) are forms which resemble the members of the last group in some respects, but are more complex in structure, with shells composed of a lattice-work of flinty matter. These shells cover large tracts of the floor of the deeper parts of the ocean (limy shells dissolve before getting so far), and make up "radiolarian oozes," such as Barbadoes earth.

Flagellates are immensely numerous animalcules with a body of definite shape covered by a membrane. Swimming is effected by a slender thread of flagellum (Latin for whip-lash) of living substance, which executes whip-like movements. They are common in ponds and ditches, where it often makes up a green scum. A mouth is situated at the base of the flagellum, and at this end there is also a red eye-spot. Some flagellates bear more than one flagellum, many are fixed, and the colonial condition is common. The exceedingly minute animalcules which swarm in putrid fluids and are vaguely known as "monads" belong to this group.

Ciliates like flagellates, are invested in a firm membrane, and therefore of definite form. Instead of flagella, they possess cilia, short threads of living substance which are associated in large numbers, and alternately bend and straighten in a rhythmic fashion, bringing about locomotion in free species, or setting up currents in the water in fixed ones.

Despite their apparent insignificance, certain animalcules, by virtue of their almost imperishable skeletons, are among the most important agencies which have built up the crust of the earth. The surface of the sea is largely inhabited by Radiolarians and Foraminifera, the former preponderating in cold, the latter in temperate and tropical waters. As they die, their skeletons sink to the bottom and form mud or ooze, which through time and pressure becomes consolidated into rock.

It is generally believed that sheep were the very first of all domesticated animals. Doubtless because they supplied him with food and clothing and by reason of their gentleness, they were selected by man as his first animal associate.

DOMESTICATED ANIMALS

DOMESTICATED MAMMALS: Alpaca, Ass, Camel, Cat, Cattle, Dog, Elephant, Gayal, Goat, Guinea Pig, Horse, Llama, Rabbit, Reindeer, Sheep, Swine, Yak, Zebu. **DOMESTICATED FISH:** Carp, Goldfish. **DOMESTICATED BIRDS:** Canary, Chickens or Fowls, Duck, Guinea, Goose, Ostrich, Parrot, Peacock, Pigeon, Swan, Turkey. **DOMESTICATED INSECTS:** Bee, Cochineal, Silkworm, Moth.

DOMESTIC animals are those kept for the use or companionship of man. When studied in their relation to the animal kingdom as a whole it is readily seen that they belong to the highest groups of animals; but the actual process of original domestication is unknown to us. It is also very evident that the origin of some of the domesticated groups themselves is very obscure. In general it may be said that only when a distinct breed has been produced by human interference may we call the result domestication.

CLASSES TO WHICH THE DOMESTIC ANIMALS BELONG

Among the highest class of animals—the Mammals—familiar illustrations are dogs and cats, horses and asses, cattle, elephants, camels, and the like. Birds include the domesticated pigeons, fowls, ducks, ostrich, peacock, canary, and others. Among fishes, goldfish and carp belong to the domestic class; while the honey bee and the silkworm moth belong to the lowest domestic group—the insects.

WHERE ANIMALS WERE FIRST DOMESTICATED

The original home of fully three-fourths of our domestic animals was the continent of Asia, where, also, the first home of man himself is placed. It seems quite probable that nearly all of these animals were first held as captives by the early peoples for food supply, and that their other uses developed later. As the races spread to the continent of Europe and thence over the habitable world, their animal servants spread with them, and others were added, adapted to varying climatic and other conditions. Our own continent—North America—has added only the turkey and the cochineal insect, while South America has contributed the alpaca, llama, and guinea-pig. No new domestic animals have been developed during the last two thousand years; and the natural conclusion is that all must have come into use at various stages from the very earliest period of man down to the time of the Christian Era.

RESULTS OF DOMESTICATION ON ANIMALS

Many animals have been greatly changed in form, size and habits by domestication, especially the dog, sheep, pig, donkey, pigeon and chicken, so that a great variety of breeds and strains have been developed. Many kinds of dogs are incapable of existence apart from human care. The donkey does not run wild, and chickens are never found at a great distance from human habitations. Others, though much varied in form and size, are still capable of independent existence, such as the horse, goat, ox, cat, and goose, but a group like the cheetah, water buffalo, and swan are only partially domesticated, and little changed by association with man.

DOMESTICATED MAMMALS

Alpaca (*Auchenia Paco*), an animal of the same genus with the llama, belongs to the Camel family, is the half-domesticated form of the wild vicuna. It is remarkable for the length and fineness of the wool, which is of a silken texture, and of an uncommonly lustrous, almost metallic appearance. The alpaca is smaller than the llama, and, in form, somewhat resembles the sheep, but has a longer neck and more elegant head. It carries its long neck erect; its motions are free and active, its ordinary pace a rapid, bounding canter. The eyes are very large and beautiful. The wool, if regularly shorn, is supposed to grow about six or eight inches in a year; but if allowed to remain upon the animal for several years, attains a much greater length, sometimes even thirty inches, and not unfrequently twenty. Its color varies; it is often yellowish brown; sometimes gray, or approaching to white; sometimes almost black.

The alpaca is a native of the Andes, from the equator to Tierra del Fuego, but is most frequent on the highest mountains of Peru and Chile, almost on the borders of perpetual snow, congregating in flocks of one or two hundred. The Peruvians keep vast flocks of them for the sake of the silky luster and fineness of their wool, which furnishes material for the best of fabrics.

The alpaca does not acclimatize in other regions of the world, and all attempts to introduce and establish it as a wool-bearing animal in Europe and the United States have failed.

Ass (*Equus asinus*), a species of the horse genus, supposed to have sprung from the wild variety (*Asinus tæniopus*) found in Abyssinia. It differs from the horse in having short hair at the root of the tail and a long tuft at the end, in the absence of warts on the hind-legs, and in the persistence of stripes, except in albinos. The upright mane, the long ears, the cross stripe on the shoulders, and the dark bands on the back are also characteristic. The domestication took place at an early date, probably before that of the horse. It was brought to Mexico and South America by the Spaniards.

In Arabia, Syria, Egypt, Spain, Kentucky, and elsewhere asses are well cared for, and the breed has been considerably varied and improved. The stupidity for which the animal has for long been proverbially reproached seems largely the result of human influence.

The MULE is a hybrid bred between mare and male ass; while the hinny is the rarer result of hybridism between horse and female ass. The mule is much nearer in temper and appearance to the ass than to the horse; the hinny in some points resembles the horse more, as it neighs, while the mule brays like the ass. The ass is admirably adapted for a beast of burden, being remarkable for endurance, hardiness, and docility under kind treatment. It varies greatly in size, from dwarf forms only twenty to thirty inches high in the West Indies to fine Spanish and American breeds sixteen hands high.

The BURRO, used almost exclusively as a pack animal by miners and prospectors in the mountain regions of the western states, is a small form.

Banteng (*Bos sondaicus*), a species of ox, a native of Java and Borneo, which, in color, shape, horns, and absence of dewlap, bears some resemblance in appearance and ferocity to the gaur (*Bos gaurus*) of India. It is black, with white legs; the hair is short and sleek; the limbs slender; the muzzle sharp; the back rises into a high arch immediately behind the neck.

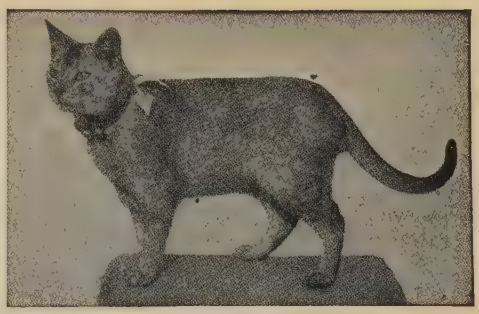
Camel (*camelus*), called by the Arabs the "ship of the desert" is a misshapen animal of the even-toed group. In this family, the upper lip is hairy and deeply cleft; the neck is very long; the feet (with two toes) are not enhoofed, but provided with callous soles; and the stomach has three compartments. The family includes the camels proper and the various forms of alpaca.

The camels are well known for their large size, for their dorsal humps, for their callosities on knees, breast, etc., for the common sole uniting the two toes. The ears are small and rounded; the short tail bears a terminal switch; the hair is tangled and felted; a single young one is born; and the diet is wholly vegetarian.

One species is usually spoken of as the DROMEDARY. It has a single hump and a generally reddish-gray color. There are many breeds, and the dromedary is the most agile of these. Apart from its use in transit and transport, the flesh is eaten, the milk made into butter and cheese, the hair woven into fabrics of various degrees of fineness, and the skin tanned.

The other camel is known as the Bactrian, and is distinguished by its slightly larger size, two dorsal humps, and somewhat finer brown or reddish hair. This camel is bred in central Asia, and in its adaptability to domestication, as well as in its natural adaptation to desert life, is a most useful animal. Its frugal diet, its powers of storing water and of going long without a fresh supply, and its great strength are very familiar facts. A camel will eat almost any herbage or green thing it comes across, even dried, leafless twigs. The hair of

BLUE RUSSIAN



ABYSSINIAN

the camel forms the woof and cotton the warp of the famous Persian camel's-hair cloth. Coarser camel's wool or hair is imported for various purposes.

The Bactrian camel can carry one thousand pounds weight or more, and the dromedary proper can cover one hundred miles in a day. The ordinary jog of a camel is about two and one-half miles an hour, but this can be kept up for many days with little food and less drink. A swift dromedary may go ten miles an hour. A thousand or more may journey in a caravan, and the amount of food carried is surprisingly small. The hump must be in good condition before starting. In the stomach-reservoirs a gallon and a half of water can be stowed away. Like some other frugal animals, the camel enjoys a long life of thirty or forty years.

In disposition the camel is peculiarly stolid, not to say stupid. Whether domestication has been too much for it, there can be no doubt that its "docility" is more the result of habitual nonchalance than any outcome of intelligent subservience. It is usually very submissive, except when habitually thwarted or ill-treated.

The camel is the most useful and important of all African domestic animals; without it commerce would be impossible across some districts which are nearly devoid of water and plants. In Australia, also, it has become valuable for interior expeditions, and camel corps have been formed by European troops in the Sudan, and are a permanent branch of the Egyptian army.

Cat (*Felis domestica*) is known to everybody. Its nearest relation is the WILD CAT (*Felis catus*), but it is not a tamed descendant of this wild cat but seems, like other domestic animals, to have come from the East. It is usually, though not with absolute certainty, regarded as the descendant of the Egyptian cat which was domesticated in Egypt thirteen centuries B. C. From Egypt the domestic cat spread through Europe, and was confined to those who could afford a high price for the pet.

PERSIAN, OR ANGORA (above)
MALTESE KITTENS (below)

THE VARIETIES OF CATS ARE DUE TO COLOR AND FUR

The varieties of domestic cat concern color and quality of fur, not differences of form, as in the case of dogs. Thus we have (1) black cats with clear yellow eyes, usually with a few white hairs, and with hints of markings in the kittens; (2) white cats, sometimes with blue eyes, and then generally deaf; (3) tabby cats, like the wild species, and perhaps the result of crossing with the same; (4) gray cats, which are rare, and differ from the tabby forms in having no black stripes, except the common ones over the forelegs; (5) tortoise-shell, fawn-colored, and mottled with black, usually females; and (6) sandy-colored, usually males. The royal Siamese cat is fawn-colored, with blue eyes and small head; the Carthusian or blue cat has long, dark, grayish-blue fur, with black

lips and soles; the Angora, or Persian cat is large, fine furred, generally white, tending to yellow or gray, and possibly derived from an Asiatic species. The Malay cat, in Pegu, Siam, and Burma, has a tail only half the normal length; the Manx cat of the Isle of Man is tailless and has longer hind-legs. A fine all-blue cat comes from Russia and Iceland, and there are characteristic breeds from India, Abyssinia, and other parts of the world.

CHARACTERISTICS AND HABITS OF CATS

The domestic cat is too well known to require description. It has been known to attain a weight of twenty-three pounds and an age of eighteen years. Though thoroughly domesticated, it retains many characteristics of wildness, especially in its private hunting expeditions, nocturnal wanderings, unsocial habits, and generally self-centered, not entirely confident disposition. When turned out in the woods it usually adapts itself readily. Domestication has had a different influence on cat and on dog, and the former may be fairly said to have surrendered itself less. Its sense of smell has probably degenerated, but is still very sensitive to certain favorite odors. The great dilatability of the pupil enables it to make the most of feeble light. The dry fur, freed from any oily matter and readily injured by water, becomes highly electric by friction, especially in dry or frosty weather.

CATS POSSESS UNUSUAL INTELLIGENCE

In cats the senses of sight, hearing, and touch are very highly developed, and the intelligence is proportionately great. That they exhibit great adroitness in catching their prey is well known, but the climax is reached in certain recorded cases where a young bird was used as a decoy for its parents, and where crumbs were scattered or scraped from beneath the snow to attract sparrows. A remarkable case is recorded of a cat which, being accidentally ignited by paraffin, ran one hundred yards and plunged into a trough of water.

SUPERSTITIONS REGARDING CATS

Cats have been objects of superstition from the earliest ages. In Egypt they were held in the highest reverence; temples were erected in their honor; sacrifices and devotions were offered to them; and it was customary for the family in whose house a cat died to shave their eyebrows. The favorite shape of Satan was said to be that of a black cat, and the animal was an object of dread instead of veneration. Many people still prophesy rainy weather from a cat washing over its ears or simply its face; and a cat-call on the housetop was formerly held to signify death.

Cattle, or Ox.—All farm animals were once called cattle, belonging to the bovine genus; nowadays this term applies only to beef and dairy animals—meat cattle. Our improved breeds are descended from the wild ox (*bos*) of Europe and Asia, and have attained their size and usefulness by care, food, and selection. The uses of cattle are familiar. Their flesh is part of the daily food of man—butter, cheese, and milk are on every table; their hides go to make leather; their hair forms part of plaster; their hoofs are used for glue; their bones for fertilizer, ornaments and buttons, and many other purposes. Cattle are primarily used, however, for meat and milk. This being the case, breeders have quite naturally chosen their animals with one or another of these purposes in mind. There have been developed consequently two classes of breeders, those that excel as milk producers or butter cows, and those that on being slaughtered dress out large quantities of the most marketable meat.

TWO GENERAL TYPES OF CATTLE

The differences between these two leading classes is one of form, type and quality, as the breeders say. A good dairy cow has a very soft, mellow skin, and fine, silky hair. Her head is narrow and long, and the distance between the eyes is noticed to be great. This indicates much nerve force, an important quality of the heavy milkers. The neck of a good dairy cow is long and thin. The shoulders are thin and lithe, and narrow at the top. The back is open, angular, and tapering toward the tail. The hips are wide apart and covered with little meat. The good cow is also thin in the region of the thigh and flank, but very deep through the stomach girth, as a result of the long, open ribs. The udder is large, attached well forward on the abdomen, and high up behind. It should be full but not fleshy. The lacteal or milk veins ought also to be large, and extend considerably toward the front legs.

REPRESENTATIVE BREEDS OF MILK PRODUCERS

The Holstein-Friesians from Holland, Jerseys, Guernseys and Alderneys from the English Channel islands, the Ayrshires from Scotland. Dutch Belted, French Canadians, and Kerry cattle, the latter from Ireland, and Brown Swiss from Switzerland, are all especially dairy cattle. The Holstein-Friesians are large and noted for their heavy production of milk and at the same time large carcasses, while, on the other hand, the Jerseys, Guernseys and Alderneys are less in size and noted for the richness of their milk rather than its great quantity. The Jersey shares popular honors in the dairy world with the Holstein-Friesian.

AYRSHIRE.—Medium size, standard weight for cows 1000 pounds, bulls 1500 pounds or more. A little smoother than Jersey or Holstein but from behind wedge shape is evident. Tips of ears notched, horns white with black tips and curve outward and upward. Body large and deep, ribs well sprung, hindquarters often heavy. Udder shows high development of form and setting. Color variable though red, white and brown in patches. Mild but active disposition. Dairy breed.

BROWN-SWISS.—Weight for cows 1200 pounds and bulls 1800 pounds. Colors shade from light to dark chestnut brown. Light tuft of hair between horns, on inside of ears, and a narrow line along back. Nose black, mouth surrounded with meal-colored band. Horns with black tips, medium size. Face dishing, large, full eye; ribs well sprung. Hoofs and tongue black, udder large, extending well up in front and rear. Teats large, well placed. Short legs. Dairy breed.

GUERNSEY.—Clean-cut, lean face, long, thin neck, backbone rising well between shoulder blades

HOLSTEIN-FRIESIANS ON A MODERN DAIRY FARM IN IOWA

This fine breed of dairy cattle probably excels all others for the general purposes of the dairy-farm. As milk producers they outrank all other breeds as they do also in size.

A FINE FLOCK RESTING BENEATH THE TREES OF MONTANA

pelvis arching and wide, rump long, abdomen large and deep, udder full in front, of large size and capacity. Teats well apart, and of good even size. Hair a shade of fawn with white markings, cream colored nose, horns amber, small, curved and not coarse. Mature cows about 1050 pounds. Bulls 1200 to 1500 pounds. Dairy breed.

HOLSTEIN-FRIESIAN.—Color black and white piebald. Head broad between eyes, eyes large and bright, horns small, tapering toward tips, neck long, chest moderately deep and low, barrel long and wedge shaped, large abdomen, legs rather short and nearly straight and wide apart. Hair fine, soft and furry. Udder very capacious, extending well forward in front; teats well formed and wide apart. Dairy breed.

JERSEY.—Small head, muzzle black or dark in color surrounded by light or mealy strip of light skin and hair. Eyes prominent, bright and wide apart. Horns crumpled, small, often black tipped. Neck fine, clean and small. Legs short, fine boned and small. Body well rounded, large and deep. Skin mellow, loose, yellow, with short fine silky hair. Udder large, not pendulous. Teats medium size, placed far apart. Back straight from shoulder to tail. Movement light and graceful. Cows 800 to 1000 pounds, bulls 1200 to 1500 pounds. Dairy breeds.

REPRESENTATIVE BREEDS OF MEAT CATTLE

The beef cow presents a totally different appearance. She is square in shape, full and broad over the back and loins, possessing depth and quality particularly in these regions. The hips are evenly fleshed, the legs full and thick, the under line parallel with the straight back. The neck is full and short. The eye should be bright, the face short, the bones of fine texture the skin soft and pliable, and the flesh mellow, elastic to the touch, and rich in quality.

For meat the Short-horns (formerly called Durhams) and Herefords and their grades predominate. They are both English breeds with horns. In color the Short-horns are red and white or a mixture of these, while the Herefords are red with white faces, briskets, bellies and feet. The Aberdeen-Angus and Galloways are famous for their high qualities as beef makers, and are both of Scotch origin, black and hornless.

ABERDEEN-ANGUS.—Black color, polled heads, rotund compact type, smoothness of conformation, short legs, evenness of flesh when fat, deep, full hindquarters. Beef breed.

GALLOWAY.—Low, blocky animal, with long, soft, shaggy coat of black hair, hornless, well sprung in the ribs, resembling barrel in shape, which is evenly covered with juicy, lean flesh. Head short and wide, forehead broad, face clean, nostrils large. Eye large and prominent. Neck short, clean. Shoulders broad, joining body smoothly. Hindquarters long, wide, well filled. Rump straight, wide, carrying width of body out uniformly, well filled with flesh. Thighs broad and thick. Legs short and clean. Beef breed.

HEREFORD.—Color red and white. Head, including jaws and throat, white, white under neck, down the breast, under belly, and on legs. Bush of tail white, white strip on top of neck to top of shoulders, remainder of body red. Head short, forehead broad, eyes full, horns rather strong and of whitish yellow color, free from black tips, more or less drooping, neck short and thick. Hide heavy and loose and covered with dense soft coat of hair. Breast broad and full, free from loose dewlap. Shoulders broad on top. Ribs well sprung and extending well backward. Rump bones wide apart. Legs short, straight and set well apart. Line of back straight and level. Quarters full and well rounded. Beef breed.

SHORTHORN.—Head wide between eyes, short from eyes to nostril. Horns short, curved forward waxy white with dark tips. Neck short and fine. Back straight, level and broad and deeply covered with flesh. Thighs wide, deep and long, well filled down in the twist. Body deep, squarely built. Flanks well let down, underline nearly straight. Legs medium length. Colors pure red, pure white, a mixture of these colors, or roan. Beef breed.

The breeds considered as chiefly serving the dual-purposes of milk and beef-making are Red Poles and Devons, both English breeds, and some of the Short-horn families having the milking characteristic best developed.

RED POLLED.—Weight for bulls 1800 to 2000 pounds, cows 1300 to 1500 pounds. Color red. Nose flesh color. Switch of tail and udder white. Head medium length, wide between eyes. Poll well defined and prominent, neck of medium length, clean cut, straight from head to top of shoulder. Chest broad and deep, back long, straight and level, hips wide and well covered, legs short and straight. Udder full and flexible. Teats well placed and wide apart. Hide loose, mellow, with full coat of soft hair. Dual purpose breed.

CATTLE AS A FORM OF INDUSTRY

Cattle are the chief source of wealth in many regions. Just as the horse is pre-eminent as a labor animal, the ox stands first as the food producing animal in modern civilization. The aggregate value of cattle products,—beef, milk, butter, cheese, hides, etc., far exceeds that of any other animal.

The relative economy of milk and beef production is now more and more commanding attention. The experiment stations have demonstrated that good dairy cows produce human food in the form of milk much more economically than food products can be obtained in the form of beef, pork or mutton.

A REMARKABLE EXPERIMENT IN CATTLE VALUES

At one of the Stations, for example, the entire carcass of a steer and the milk of an Holstein cow were analyzed.

The steer when killed weighed twelve hundred and fifty pounds. The cow during the year gave eighteen thousand four hundred and five pounds of milk. From the milk of the cow, and from the carcass of the steer, the following number of pounds of human food substances were obtained. Of protein five hundred and fifty-two pounds from the milk, and one hundred and seventy-two pounds from the steer; of fat six hundred and eighteen pounds from the mild and three hundred and thirty-three pounds from the steer; of sugar nine hundred and twenty pounds from the milk and none from the steer: of mineral matter one hundred and twenty-eight pounds from the milk and forty-three pounds from the steer.

The steer's body contained about fifty-six per cent of water, leaving five hundred and forty-eight pounds of dry matter, which included not only the edible, dry, lean meat and fat, but also every part of the body—horns, hide, bones, internal organs, etc. In one year the cow produced two thousand two hundred and eighteen pounds of dry matter, every part of which was wholly digestible and suitable for human food. In that time she produced enough protein to build the bodies of three steers, fat

CHINESE POUCHONG

ARABIAN GAZELLE HOUND

enough for nearly two steers, and mineral matter enough for the skeletons of three, besides nine hundred and twenty pounds of milk sugar, as nutritious and useful for humans as the same weight of cane-sugar like that bought at the store.

ECONOMIC VALUE OF THE DAIRY COW

These figures explain why dairy cows and not steers are kept on the valuable lands. When the cheap lands disappear, and rough food commands higher values, the beef cow will be raised as a luxury, and cattle will make their contribution to the human race largely in the form of milk, butter, and cheese. In the future more and more will the farmers of all countries turn to the dairy cows.

Dog (*Canis familiaris*) is the most intelligent, affectionate, and devoted of domestic animals; in use by all peoples, and accompanying man throughout a wider range than any other animal, greatly exceeding the cat, donkey, or horse in this respect. It is very docile; its memory and its sense of localities and time are admirable. It is the constant companion of man, the protector of his house and of his herds, his helpmate in battle, a useful companion of the hunter, a draft animal, a guide, a buffoon, a postman, a comedian, and a brother of charity at St. Bernard. What creature can do more? Among its characteristic qualities, its faithfulness and gratitude are most prominent. No animal is attached to man in the same degree.

The domestication of the dog dates to primitive man, and far precedes the dawn of history, many important varieties being portrayed in the earliest sculptures. Most varieties have become so modified by domestication that they are unable to sustain themselves apart from man.

DIFFERENT BREEDS OF DOGS

Dogs vary widely in color, form and size; in adaptation to climate from the hairless forms of the tropics to the heavily fur-coated Eskimo breeds; and in size from tiny lapdogs no larger than kittens to great Danes standing three feet high at the shoulder. There are some two hundred varieties which have resulted from the intercrossing of about six leading types, namely: wolf-like dogs, greyhounds, spaniels, hounds, mastiffs, and terriers.

Among sporting dogs, the bloodhound stands pre-eminent for its majesty of appearance and beauty of color, and is distinguished for the keenness of its scenting powers. The head of the bloodhound is long and narrow, and "peaked" on the top of the skull. There is much loose skin about the head, and the eye is sunken, showing the red skin beneath it.

SCOTCH COLLIE (above
BIRD DOG OR POINTER (middle)
ENGLISH SETTER (lower)

The greyhound is remarkable for its fleetness of foot. In addition to its beauty and elegance, it is of a very affectionate disposition. Pointers and setters are much used by sportsmen in the field, and are possessed of keen scent and cunning. The retriever, which is useful for domestic as well as sporting purposes, is sagacious, good-tempered, and intelligent. An English retriever, whether smooth or curly coated, should be black or black and tan, or black with tabby or brindled legs. Among the terriers, or vermin killers, the best-known varieties are the fox terrier, the Skye terrier, and the Irish and Airedale terriers.

Spaniels are the oldest and the most useful generally of all breeds of sporting dogs; earnest, untiring workmen in the fields, and faithful, loving, and gentle companions when the day's work is done. They are also very beautiful, and universal favorites. The leading varieties are the black spaniel, the lurcher, the Clumber, the Sussex, and the Norfolk spaniels, and the Irish and English water spaniels.

Among other sporting dogs are the dachshund, which is crooked-legged, jealous, and affectionate; the basset-hound, the beagle, the otter-hound, the harrier, and the foxhound.

Among the large house dogs which are treasured as companions the most notable are the St. Bernard, the Newfoundland, and the mastiff. The St. Bernard is an extremely large and powerful fellow, a perfect giant among dogs, with a beautiful head and speaking contenance, in which sagacity is blended with nobility; and a body of great symmetry.

The Newfoundland, which is a capital swimmer, is a very large, jet-black dog, with a large and massive head, with a long, straight coat and bushy tail, and a face extremely expressive, and eyes that beam with intelligence.

The mastiff is a large dog, with a majestic-looking head, and is either fawn or brindle. The collie is a good companion, and a valuable sheep dog. The Dalmatian, which is white with black spots, is well known as a coach dog.

Among pet dogs, we have the fondled King Charles spaniel; the poodle, which is a good performer of tricks; the active little pug; and the watchful Pomeranian.

DOGS IN FOLKLORE AND MYTHOLOGY

Dogs still play an important part in folklore everywhere, whether as recenants whose intention is merely to warn or foretell, or as hell hounds of purely malignant nature. They are represented as quick to detect the presence of invisible spirits, and, in connection with this aptitude for seeing into the spirit world, they are often the outward objects through which devils and demons make their appearance, and they have often been associated with such masters of unhallowed arts as the great Cornelius Agrippa.

The Wild Huntsman with his train of hounds is one of the most widespread superstitions in Europe, and in the dim mythological histories of the early world we find many dogs of supernatural strength and courage who give material aid to the heroes in their exploits.

The American Indian, as is well known, believed in the immortality of the dog, and always looked forward to being reunited with this faithful companion in the Happy Hunting-ground beyond the grave.

Elephant.—Though the Indian Elephant has been, and still is, used as a beast of burden, it has never reached a completely domesticated state. See further under Pachiderms.

Gayal.—Frequently domesticated, though more often found wild.

Goat (*Capra hircus*), "the peasant's cow," is found in all parts of the globe as a domestic animal. It has a beard on its chin, and carries sharp-edged horns, which incline towards its back. The common domestic goat is a variety of the wild goat (*C. hircus*) which inhabits the Taurus and other mountains of southwestern Asia. Compared with its ancestor, the domesticated form is somewhat reduced both in general size and as regards its horns. The domestication must have taken place at a very remote period, and spread from the East, probably through Egypt, westwards.

A great number of breeds now exist. A most important variety, formed into a breed by artificial selection, is the Angora goat, where almost the whole body is enveloped in that long, silky, white hair which is so valuable. The Angora goat has been introduced into the United States, Cape Colony, and Australia. The Cashmere goat, from Tibet and Bokhara, is almost equally valuable, furnishing the white to brown hair used in making Cashmere textiles, especially the famous Cashmere shawls. It has been successfully acclimatized in France.

The Rocky mountain goat is about the size of an ordinary sheep, and its general appearance is not unlike that of a sheep of the merino breed, its long, straight hair hanging down in an abundant white fleece.

Frequently goats are found wild in mountainous countries, scrambling among rocks and bushes; are extremely sure-footed, and display great strength and agility in leaping. These include the Markhor, the Alpine ibex, or Steinbock, and the Izard.

Goats are very valuable for flesh, milk, wool, and skins, particularly in warm, dry regions. The greater part of the world's goats are grown in southern Europe, northern Africa, and Syria. Goat's leather is employed for innumerable uses, some of the chief of which are glove making, shoemaking, and bookbinding. In the United States goats have never attained much importance as farm animals. They have been established in the Pacific States, however, notably in Oregon, and in Iowa and Missouri.

Guinea-pig.—Frequently domesticated as pets, but more often a game animal in the forest regions of South America.

Horse (*Equus*) is one of the noblest and most useful of animals. The horse proper is characterized by the tail with long hairs from its base; the long and flowing mane; a bare callosity on the inner surface of the hind as well as of the fore legs; and by the head and ears being smaller and the limbs longer than in the ass and other related species.

ORIGINAL HOME AND ANCESTORS OF THE HORSE

The native country of the horse seems to have been central Asia. It became early

domesticated in Egypt, and is mentioned throughout the Bible. The Greeks and Romans had some covering to secure their horses' hoofs from injury. In the ninth century, horses were only shod in time of frost. Shoeing was introduced into England by William I., 1066. It is believed that the original breed of horses is extinct, and that the half-wild herds existing in many places have descended from animals once in captivity. Thus, when the horse was first introduced by the Spaniards in 1537, at Buenos Ayres, there were no wild horses in America. But individuals escaping ran wild, and, by 1580, their descendants had spread over the continent as far as the Straits of Magellan. More fossil horses have been found in the new than in the old world. The horse may have descended from a striped ancestor, stripes still sometimes remaining, especially in duns and mouse-duns.

THE VARIOUS BREEDS OF HORSES

Like other domestic animals the horse has run into various breeds. The most celebrated is the Arab horse. Great attention is given in America to the breeding of horses, and American horses have won races both in England and on the Continent.

While the increasing use of automobiles by farmers and others may have a more or less depressing effect upon the demand for some classes of horses, no machine can successfully supersede the horse in more than a part of his many uses in business, sport and pleasure. There is a prevailing tendency toward heavier horses for farm work, and draft work in cities as well.

Of the draft breeds the Percherons, of French origin, are regarded with high favor, while the Clydesdales, from Scotland, have a well merited if not equal popularity. The English Shire and Belgian horses are also excellent types of the drafters. Cleveland Bays, one of the oldest and most popular of the English Coach breeds, are quite appropriately termed "the general utility horse," while the admirers of the German and Franch Coachers, as yet comparatively few in numbers in the United States, regard them as unexcelled for similar purposes. Hackneys are pre-eminently adapted to drawing any sort of vehicle at a rapid pace on the road, and French Coachers are in demand for large, stylish, high-stepping carriage teams and single drivers.

Thoroughbreds are probably the oldest and best established of all the breeds of Europe and America. They are distinctly of British production, and especially noted for endurance and speed on the race course. The term Thoroughbred, when applied to horses, is used to designate one particular breed, the running or race horse. Standard bred classes include the trotter and his immediate fellow, the pacer. They are American productions of modern times, the outgrowth of the commercial tendencies of Americans, coupled with their ardent love for tests of speed, and fast, level-headed roadsters for light business and pleasure driving, used single or in pairs. The chief families of trotters are Hambletonians, the Mambrinos, the Clays, the Morgans, the Bashaws and the Pilots, all, except the Morgans, more or less related, and tracing their ancestry, directly or indirectly, to an imported English Thoroughbred sire, foaled in 1780, and known as Messenger.

Other breeds of horses, but of extremely small numbers, in America are the Suffolk Punch, for draft; Orloff trotters, and Shetland, Welsh and Exmoor ponies.

Of the smaller breeds of horses, the Shetland Pony is best known. Only seven or eight hands high (a hand equals four inches), they are as docile as they are hardy. Their coats are shaggy, and in winter become so matted as to protect the animals from the severe weather experienced in their northern home. Notwithstanding their small size, they are wonderfully strong, and are capable of exertion without fatigue.

THE NOBLE CHARACTER OF THE HORSE

The horse is not only a fiery racer, but displays all the noble characteristics of fidelity, gratitude, attachment, and compassion. It also exhibits a talent for understanding, has an almost unfailing memory, and a very rare docility. With patience and kind treatment the horse can be trained to go through quite complicated feats of memory and perception. That it possesses also an accurate sense of time is clear from the facility with which it can be taught to walk, trot, and dance to music, or take part in concerted evolutions. It is very timid and cautious and suspicious of every new sight or sound; while in respect of moral qualities it is scarcely too much to say that horses are as diverse as men.

CHIEF CHARACTERISTICS OF LEADING DRAFT HORSES

BELGIAN DRAFT.—Short body set on short legs. Tendons of legs large. Head good size. Eyes small, neck short, thick and well crested. Shoulders heavily muscled. Chest deep and wide, good barrel. Back short, broad and inclined to sag. Loins wide, short and very thick. Flank low and full. Hindquarters short, very wide, muscular. Lower thighs very wide, well muscled. Hocks round and meaty. Colors, chestnut, roan, brown and bay.

CLYDESDALE.—Weight 1700 to 2000 pounds for stallions, 1500 to 1800 pounds for mares. Height sixteen to sixteen and one-half hands. Colors, bay, brown, black or chestnut, with white markings on face and legs. Head intelligent. Shoulders good, which gives a free, easy, long stride. High withers. Arm well muscled. Feathering on leg is fine, silky and long. Quarters and croup muscular. Springy, strong pastern. Front action free and snappy.

HACKNEY.—Considerable substance, very smooth, gracefully curved outlines, rather short legs, head well proportioned, full, bright eyes, well developed neck, shoulders long and sloping, well muscled. Body deep and round-ribbed. Muscular loins and quarters, strong hocks, excellent action. Colors brown, bay or chestnut, with white markings. Height fifteen and two-tenths to sixteen hands.

PERCHERON.—Height fifteen and one-quarter to sixteen and one-half hands. Weight 1500 to 2000 pounds. Colors, gray and black. Active temperament, intelligent head, deep body, wide, muscular croup, clean-cut legs, joints clean and hard; legs show abundance of quality. Good action.

SHIRE.—Conformation low, broad and stout. Heavy in build, slow in movement. Large girth, deep and strongly coupled with broad back, quarters heavily muscled, legs strong, feet large. Feathering on legs below knees and hocks. Weight

2200 pounds. Height 17 hands. Colors brown, bay or black with white markings on face and legs.

SUFFOLK PUNCH.—Low-set, short legs, deep body, muscular, durable feet. Head clean cut, with full forehead and Roman nose, neck full, with strong crest, chest deep and wide. Barrel deep, round-ribbed, and well let down on hind flank. Legs and hindquarters muscular. Height sixteen and one-half hands. Weight 2000 pounds. Color chestnut.

CHARACTERISTICS OF LEADING SADDLE AND DRIVING HORSES

AMERICAN SADDLE HORSE.—Head rather small and clean cut. Eyes wide apart, full, clear and prominent. Ears pointed. Long, upright neck, sloping shoulders. Deep chest, short, strong back. Barrel ribbed well back. Strong coupling, quarters level, strongly muscled. Pasterns long and sloping. Bones of leg broad and flat, strong tendons. Height about fifteen hands, two inches. Weight about 1000 pounds.

FRENCH COACH.—Height sixteen hands. Weight 1000 to 1400 pounds. Rather upstanding. Smooth and symmetrical, fine quality, clean cut, intelligent head, long, graceful neck, closely ribbed body, muscular quarters. Legs well set and fine. High, free knee action, regular uplifting hock action. Colors bay, brown or black.

GERMAN COACH.—Colors bay, brown or black. Height sixteen to sixteen and one-half hands. Weight 1350 to 1450 pounds. Deep, round body, well proportioned, close ribs, neck long and high set on shoulders, neat head, intelligent face. Back short and strong, smooth at coupling, plump rounded quarters, strongly muscled limbs, strong hock, good feet.

SHETLAND PONY.—Height ten hands two inches. Weight 325 to 375 pounds. Compact build, deep body, heavy muscular quarters, short legs, short broad back, deep full chest, muscular neck, small head and ears, prominent eyes, docile disposition. Colors brown, black and bay. Long shaggy coats, heavy, long mane.

STANDARD-BRED TROTTER.—Head well proportioned, clean cut, neck long and muscular, crested in stallions. Shoulders well muscled, chest low, foreleg long from elbow to knee, short from knee to fetlock. Pasterns sloping, feet moderate in size, oily in appearance. Back and loin well muscled, hind quarters and croup well muscled and smooth. No fixed colors. Height sixteen hands. Weight for mares 900 pounds, stallions 1150 pounds.

THOROUGHBRED.—Very deep, narrow chest, long legs. Refinement and clear definition of feature. Large nostrils, full, clear eyes, broad forehead, neck long and straight, sloping shoulder, muscular hindquarters, sharp withers, well marked superficial blood vessels, silky skin and hair. Colors bay, brown or chestnut, more or less white in face and limbs. Height fifteen to sixteen hands. Weight 900 to 1050 pounds.

WELSH PONY.—Good shoulders, strong back, neat head, best of legs and feet. Height twelve to thirteen hands. Colors bay or brown, gray or black. Great strength and endurance.

Llama (*Auchenia lama*), a most useful South American domesticated variety of the guanaco whose herds roam with the rheas on the plains of Patagonia, or climb on the Cordilleras. As a beast of burden the llama was in general use at the time of the Spanish conquest, and its sure-footedness and power of foraging for itself make it most valuable for transport in the rough and steep mining regions of the Andes. In many places, however, mules have to some extent replaced the llamas. The males carry a hundredweight about twelve miles in a day. The females, which are kept for breeding, are smaller and less strong than the males. The animal is larger and stouter than the allied species, the alpaca, stands about three feet high at the shoulders, and keeps its head raised.

The reader of the story of "Robinson Crusoe" will remember that a llama, with its two young ones, were his first household companions.

Rabbit.—See page 198, under Hare.

Reindeer (*Rangifer tarandus*) is the only representative of the genus. It is a native of the northern parts of Europe, Asia and America, and was introduced into Iceland in 1770. It is by far the most valuable of the deer, for not only are the flesh and skin of much use, but the animal has long been domesticated in Scandinavia, especially among the Laplanders.

The wild reindeer of Lapland is almost equal in size to the stag, but there are great differences of size in different districts, the largest size being generally attained in the polar regions. The reindeer is strong, somewhat heavily built, but yet very swift. The hair is longer in winter, and is gray or brownish in color. The legs are short and thick, and the broad main hoofs spread out as the animal speeds over the snow. Besides the main hoofs, there are two accessory lateral hoofs. The head is carried horizontally, not erect as in other deer. The antlers are large and are unique in being possessed by both sexes. Moreover, they begin to appear at an early stage in life, within a few weeks after birth, and at the same time in both sexes, whereas in the other deer, in which only the males have antlers, they do not appear before nine months or more after birth.

In summer the Lapland reindeer feeds chiefly on the shoots of willow and birch, while in the winter it depends mainly on lichens such as the so-called reindeer moss.

In their natural life the reindeer are gregarious. They migrate from the mountains to the lowlands in winter, and return again in spring, a change in part dependent on the food-supply. It constitutes the chief part of the Lapp's wealth, and some possess tame herds of two thousand or more, which feed chiefly in the mountainous regions in summer and in the lower grounds in winter. The animal can maintain a speed of nine or ten miles an hour for a long time, and can easily draw a weight of two hundred pounds besides the sledge. The reindeer also yields excellent milk. In Siberia a large domestic reindeer is used for riding.

The CARIBOU, or American reindeer, is found in the northern parts of Canada, but is not domesticated.

Sheep (*Ovis aries*).—The common sheep was probably the first animal domesticated by man in western Asia—the first home of the human race and their propagation, care and improvement have always played a large part in the best husbandry of all lands. Domestication and selective breeding have greatly modified the sheep as to bodily size, length and quality of wool, presence and character of horns, and in the case of the so-called fat-tailed sheep, the tail has become enormously developed.

Sheep were introduced into Florida by the Spanish in 1565; into Virginia in 1609; into Massachusetts in 1624; into New York in 1625; into New Jersey and Delaware by the Swedes in 1634; into Pennsylvania in 1684; and into California by the Spanish missions from Mexico in 1773.

The flesh of sheep is both a staple and a delicacy, and from their wool has been fashioned clothing to meet a wider range of requirements for bodily comfort than any other fiber, animal or vegetable, has afforded. Their skins are a large factor in manufacture, arts and commerce.

The common classification of sheep is according to the characteristics of their fleeces, as "fine wools," "long wools" and "medium wools." The American Merino, the Delaine Merino, and Rambouillet belong to the first named class, or fine wools; the Leicester, Lincoln and Cotswold, to the long wools; and the Southdown, Tunis, Dorset, Shropshire, Chevoit, Suffolk, Hampshire and Oxford, to the medium wools. The fine wool breeds are reared chiefly for wool, while the others are kept for both wool and mutton. Nearly all the breeds in the United States, except the Merino, were imported from Great Britain. Wyoming, Montana, New Mexico and Idaho are foremost in sheep and wool-growing, and theirs, with those of Utah and Oregon, make nearly half of the total production in the United States.

The good-nature, gentleness, and patience of sheep have become proverbial; it is therefore not to be wondered at that they are the pets of children, and that the playful gambols and antics of the lambs amuse young and old alike.

CHARACTERISTICS OF REPRESENTATIVE WOOL BREEDS

LEICESTER.—Hornless, large size, rectangular form of body on clean legs, bare faces or carrying a very scant topknot. Head long, tapering toward muzzle, face wedge-shaped, covered with fine white hairs, eyes large and prominent, neck strong and moderately short. Breast deep, broad and full. Back broad and well fleshed. Legs of moderate length. Fleece fine, uniform, curly, with bright luster.

LINCOLN.—Large size with heavy fleece of long wavy or curly wool and moderate tuft of wool on face. Color white, head large, without horns, body deep, back wide and straight. Legs broad and set well apart. Weight for rams 250 pounds, ewes 200 pounds.

MERINO.—Distinguished by its very fine wool, usually delicately crimped. Wool generally short and dense. Grows to tips of ears and hoofs of feet. Form, when shorn, angular, shoulders narrow, back not usually so straight or strong as English breeds, legs less straight and neck more slender. Ram usually has horns. Very enduring and resistant. The American merino has three to five heavy folds on neck, and folds on arm and sides and across hips. Fleece covers entire sheep except tip of nose and hoofs. Eyes hidden by wool. Outside of fleece a dirty brown, but inside white. Ewes 80 to 100 pounds, rams 100 to 175 pounds. Delaine merinos have smoother bodies than the American, and fewer folds and wrinkles. Mature ewes 100 to 150 pounds, rams 140 to 200 pounds. Rambouillet merinos have large bodies, usually smooth and free from wrinkles, except perhaps on neck. Fleece fine and white. Rams usually have large spirally curved horns, ewes hornless. Legs long. Rams 175 to 185 pounds, ewes 140 to 160 pounds.

REPRESENTATIVE MUTTON PRODUCING BREEDS

CHEVIOT.—Medium size, hornless, face and legs white, body closely covered with wool of soft fiber and pure white. Head bold and broad. Fleece forms almost a ruff about face. Deep and large in breast, back wide and straight. Short legs set well apart, hoofs black. Mature rams 200 pounds, ewes 150 pounds.

COTSWOLD.—Large, high-standing breed with heavy fleece of long white, lustrous wool. Ample topknot often covering eyes. Bold, upright carriage. Head moderately small, face white or mixed with gray, eyes prominent, neck short, thick and strong, shoulders broad and full, back broad, breast broad and well forward, quarters long and full, mutton quite down to hock. Weight of ram 250 pounds, ewe 200 pounds.

DORSET-HORN.—Face and legs pure white, flesh-colored nose. Both sexes have horns. Eyes prominent, neck short and symmetrical, shoulders broad and full. Chest full and deep, quarters wide and full with mutton extending down to hock. Fleece medium grade, of even quality, extending over belly and well down on legs. Short, stout legs. Weight for rams 200 pounds, ewes 160 pounds.

HAMPSHIRE DOWN.—Black face, head large, well covered with wool on forehead and cheeks, nostrils wide. Ears large and drooping, eyes prominent and lustrous, legs well under outside of body, straight, almost black. Chest deep and full with breast prominent and full, back straight, quarters long and deep in thigh. Ewes prolific and heavy milkers. Weight for rams 250 pounds, ewes 185 to 195 pounds.

OXFORD DOWN.—Largest of down breeds. Nearly straight on underline. Long and coarse fleece. Very stately appearance. Color of face and legs brown, which is often flecked with gray. Ewes very prolific and heavy milkers. Not hardy under American climatic conditions. Rams 250 to 350 pounds, ewes 180 to 275 pounds.

SHROPSHIRE DOWN.—Dark brown face and legs. Broad head, short face, thick muscular neck, body somewhat barrel shaped, except that it is straight on back. Body, head and legs to knees covered with fleece of even length and quality. Weight for rams 225 pounds, ewes 175 pounds.

SOUTH DOWN.—Smallest of down breeds, but the model in form. Short, straight legs, wide apart; broad level back, thickly fleshed; long, broad hips; neck short, thick at shoulder; head small, forehead full, face short, eyes prominent, ears small. Face and legs uniform reddish brown. Hindquarters carry down very heavy; breast broad and prominent. Fleece compact, long and close wool, white and carrying some yolk. Best weight for rams 200 pounds, ewes 150 pounds.

SUFFOLK DOWN.—Large, rangy sheep, black-faced, hornless, with long, clean, black legs. Wool is of good quality and mutton is excellent. A good feeder and very prolific.

Swine, Pig or Hog (*Sus*).—There are numerous varieties of the domestic pig. Some have erect and some pendent ears, and those are most esteemed which exhibit the greatest departure from the wild type, notably in shorter and less powerful limbs, less muscular and more rounded forms, wider ribs, and greater wealth of flesh.

The domestication of the pig is remotely ancient, having been established among the Chinese for some thousands of years. It was brought to America by the early colonists. However, it is only during the last two hundred years that the pig has reached its present highly modified state of domestication,

and only during the last century has selective breeding been carried on to secure rapid growth and much fat.

The Chinese breed is renowned for its fertility. Its head is short and thick, ears erect, legs very short, chine high and broad, and jowl wide, belly hanging very near to the ground. As a rule it carries a small quantity of hair. The skin is usually dark, but the flesh is delicate and white. The Neapolitan breed is entirely black, with little hair, remarkably easy to fatten, but scarcely so robust in constitution or so prolific as the Chinese pig.

Swine are most profitably reared where corn and grass most abound; hence, they are found in America in largest numbers and highest development, the United States not infrequently having upwards of fifty per cent of the world's supply. In America the industry centers in the Mississippi valley, where Indian corn is grown in greatest abundance and at least expense, particularly in the states of Iowa, Illinois, Texas, Nebraska, Missouri, Indiana, Ohio and Kansas. These swine are mostly of the four breeds of the large of "lard" type, viz.: Poland-Chinas, and Berkshires, Duroc-Jerseys and Chester Whites, the Poland-Chinas predominating.

DESCRIPTIONS OF REPRESENTATIVE BREEDS

BERKSHIRE.—Rather more than medium size. Snout of medium length, face dished. Ears nearly erect, well carried. Jowl heavy. Neck short with considerable crest. Shoulder, back and rump of good width. Body deep. Ham thickly meated, strong constitution. Color black with a white mark on face. White on each foot and on tip of tail.

CHESHIRE.—Medium size. Body has good length. Shoulders and hams well developed. Face slightly dished. Ear small and erect. Bone fine and of fair quality. Color white. Black spots often occur on skin.

CHESTER-WHITE.—Medium size, face straight or very slightly dished. Ear droops and is somewhat loosely attached to head. Color white, hair in many specimens wavy or curly. Neck wide, deep and short. Jowl smooth, neat and firm. Shoulders broad, deep and full. Chest large, deep, full in girth. Sides full, smooth, deep; ham broad, full, long, wide and deep. Back broad on top, straight or slightly arched, legs short and straight. Coat fine. Weight of boars two years old 500 pounds, sows 450 pounds.

DUROC-JERSEY.—Medium size, fine bone. Snout medium length, face slightly dished, ear drooped, jowl heavy, body wide and deep set on short legs. Ham heavily fleshed. Cherry red the popular color, but yellowish red and chestnut are often seen. Weight of boars two years old 600 pounds, sows 500 pounds.

HAMPSHIRE or THIN-RIND SWINE.—Medium size, face straight, ear inclined forward, but does not droop. Jowl light, as is also shoulder and ham. Back of medium width. Legs of medium length and bone of good quality. Color black extremities with a white belt four to twelve inches wide encircling body and including fore-legs, which should also be white. Weight, boars two years old 450 pounds, sows 400 pounds.

LARGE YORKSHIRE.—One of the largest breeds. Snout of medium length, with little or no dish. Moderate dish in face. Jowl of good width and muscular. Ears rather large, firmly attached, fringed with fine hair. Shoulders and back of medium width. Side long. Ham lighter than that of lard type with flesh carried well round inside of thigh. Legs medium length. Bone fairly heavy, clean and flinty. Color, white.

POLAND-CHINA.—Medium size. Face slightly dished. Jowl full and heavy. Ears fine, firmly attached; about one-third of ear droops. Neck short, thick and heavily arched on top. Shoulder heavy. Side short. Back wide. Ham very wide and deep. Legs short, bone fine. Black with six white points on face, feet and tip of tail. Weight of boars two years old 600 pounds, sows 500 pounds.

TAMWORTH.—Should have golden-red hair on a flesh-colored skin, free from black. Snout long and straight. Ear large. Jowl narrow and light. Neck and shoulder are light; back and loin of medium width, side of good length, moderately deep. Rather deficient in ham. Legs long and strong.

Yak (*Bos grunniens*), a species of ox found in Tibet, and domesticated there. The wild yak of central Asia is the largest native animal of Tibet, and is found only near the limits of perpetual snow. The domesticated yak, which forms great part of the wealth of the inhabitants of central Asia, is about the height of an American ox, which it much resembles also in body, head, and legs; but it is covered all over with a thick coat of long, silky hair, that of the lower parts of the body being very long and hanging down almost to the ground. The neck is short; the rump is low; the legs are short. Over the shoulders there is a bunch of long hair; and the tail is covered with a prodigious quantity of long, flowing hair. Its milk is very rich, and yields excellent butter and curd.

Zebu (*Bos indicus*), an ox which exists only in a domesticated state in Asia. It is characterized chiefly by its large hump, or sometimes two humps, over the withers and by a greatly developed dewlap. Its color varies from ashen grey to pure white, and white bulls, known as Brahmin bulls, are held sacred by the Hindus and allowed to wander at will. They vary greatly in size, and in India are used as beasts of burden and draft.

DOMESTICATED FISH

Carp (*Cyprinus*), constitutes a group of fishes without spines in the fins. The true carp originated in China and was introduced into Europe three hundred years ago, and much later into America. The back is blackish gray or brown, the sides yellowish brown, the belly yellow. The usual length is between one and two feet, but large forms five feet long or more have been caught.

The carp is mainly vegetarian, but also eats small animals, such as larvæ and worms. The general habit is sluggish, except at the spawning period in May and June. Their longevity is great; some are said to have lived one hundred and fifty to two hundred years. The carp is an important food fish, and is largely bred in the United States.

Goldfish, or GOLDEN CARP (*Carassius auratus*), a Chinese and Japanese fresh-water fish nearly allied to the carp but lacking barbels. In its warm native waters it is brownish, like its neighbor species, the crucian carp (*C. carassius*) while in its more familiar domesticated state it loses the black and brown pigment, becomes golden-yellow, or passes more completely into albinism in those unpigmented forms known as silver fish. The goldfish is naturalized in some rivers, and has had a wide artificial distribution throughout the world.

BUSY BIDDY AND HER BROOD OF NEW-BORN CHICKS

DOMESTICATED BIRDS

Canary.—See page 213.

Chickens (*Gallus domestica*), or FOWLS, are widely distributed and almost universally raised in every rural home. Immense poultry plants have been built up in America in recent years, and the business developed to proportions of a notably distinct industry. The contributions of poultry to the nation's wealth, mostly by the hands of farmers' wives, reaches an annual total of half a billion dollars or more—an amount equal to the average value of the nation's wheat crop.

Apart from the intrinsic merits of the individual breeds, and the better understood methods of breeding and management, much progress has been due to artificial methods of hatching and rearing the young fowls. The incubator and the brooder make it possible to secure chicks at any season of the year, and thus permits the development of special branches of poultry raising, such as the production of broilers and soft roasters.

There are numerous standard varieties of chickens recognized in the United States, subdivided into four general classes, as follows: The general-purpose breeds—the American class—Plymouth Rock, the Wyandotte, and Dominique; the heavier, clumsier or meat breeds, such as the Brahma, Cochin, and Langshan; the egg breeds, as the Leghorn, Minorca, Andalusian, and Black Spanish; the ornamental breeds, as the various Bantams, and others. Some other breeds on American farms are the Rhode Island Red, Orpington, Houdan, Dorking and Hamburg.

LEADING BREEDS OF POULTRY DESCRIBED

BRAHMA.—Meat breed. Two varieties, light and dark. Show heavy leg and toe feathering, thick, close plumage. General color of light Brahma, white, with black tail and black center stripes in both hackle and saddle feathers. In dark Brahma, wings of cock crossed by heavy black bar, and entire breast, body, leg and toes black. Back, wings, body and breast of female have a basis of gray on which are distinct dark pencilings. Weight for dark cocks eleven pounds, hens eight and one-half pounds; for light cocks twelve pounds, hens nine and one-half pounds. Brown egg.

COCHIN.—Meat breed. Four varieties, buff, partridge, white, black. Peculiarity is an appearance of massiveness and fluffiness. Heavy, short feathering is piled high on back and extends wide at sides. Excessive thigh and shank feathering. Combs single, low, close on head and evenly serrated with five distinct points. Cocks weigh eleven pounds, hens eight and one-half pounds. Brown egg.

DORKING.—General purpose, meat especially. Three varieties, colored, white and silver-gray. Body long and deep. Carries abundance of flesh. Skin white. Colored largest cocks weigh nine pounds and hens seven pounds. White cocks weigh seven and one-half pounds, hens six pounds. Silver-gray variety is between these two. All have a fifth toe. Eggs of very light color.

HAMBURG.—Egg and fancy breed. Six varieties, golden spangled, silver spangled, golden penciled, silver penciled, white and black. About size of the Leghorn. White egg.

HOUDAN.—General breeding purposes. Color black and white evenly broken in alternate splotches throughout entire plumage. Head ornaments of crest and beard. White skin. Carry fifth toe on each foot. Cocks weigh seven pounds, hens six pounds. White egg.

INDIAN.—Meat breed. Two varieties, Cornish and white. Beaks and shanks yellow. Bird of strong proportions. Back and wings of cock mixture of red and black, tail and breast black. Hen's back, wings, breast and body a rich bay penciled with black. Cocks weigh nine pounds, hens six and one-half pounds. Tinted egg.

LEGHORN.—Egg production. Eight varieties, single-comb and rose-comb brown, single-comb and rose-comb white, single-comb and rose-comb buff, single-comb black and single-comb silver duckwing. Characterized by early maturity and great activity. Large combs on the top of head. White egg.

MINORCA.—Egg breed. Three varieties, single-comb black, rose-comb black, single-comb white. Long body, carried rather upright, deep at breast with back tapering sharply toward tail, which is long and carried rather low. Comb large. Ear lobes large and pure white. Cocks of rose-comb weigh eight pounds, hens six and one-half pounds. Single-combs weigh one pound heavier. White egg.

ORPINGTON.—General purpose. Three varieties, buff, black and white. Long body, abundant plumage, white skin. Short, heavy shanks. Tendency to feathering on shanks. Cock weighs ten pounds, hen eight pounds. Egg tinted.

PLYMOUTH ROCK.—General purpose, for both meat and eggs. Three varieties, the barred, white and buff. Back and body rather long, breast broad and deep. Single combs, yellow shanks. Cocks weight nine and one-half pounds and hens seven and one-half pounds. Brown egg.

RHODE ISLAND RED.—General purpose. Two varieties, single comb and rose-comb. Tail color black. Rhode Island red has a red surface of body plumage, with a red under color, free from slate.

Buckeye breed surface color is dark, rich garnet, and under color allows a bar of slate-color next to surface. Body of botlong, Rhode Island Reds level. Buckeye body shows slight elevation in front. Weight of Rhode Island red cocks eight and one-half pounds, hens six and one-half pounds. Buckeye cocks nine pounds, hens six pounds. Brown egg.

WYANDOTTE.—General purpose, for both meat and eggs. Eight standard varieties, white, buff, black, silver, golden, silver penciled, partridge and Columbian. A bird of curves, back short and broad, body deep and round, breast broad and deep, with a low-set keel. Shanks short, strong and carried well apart. Colors silver, white, black, buff and mixtures. Close-fitting rose combs. Abundant fluffy, close-fitting plumage. Weight eight and one-half pounds for cocks, six and one-half pounds for hens. Brown egg.

Duck (*Anas domestica*).—The various breeds of domestic duck are all descended from the wild species. The prominent characteristics of the family are familiar: the short webbed feet, with a small hind toe; the netted scales in front of the lower leg; the bill, about as long as the head, rounded at the tip, and bearing the nostrils towards the broad root. They are aquatic birds, swimming with much agility, diving comparatively little, preferring to grub in the shallows for water-plants, worms, and small animals.

Duck raising is extensive in Europe both for flesh and eggs, which are more generally used than in the United States. In eastern Asia, notably in China, ducks are grown in enormous numbers. Duck raising has become a profitable industry in the United States, particularly since the introduction of the Pekin duck, which was introduced into the United States from China in 1870.

THE CHIEF BREEDS RAISED IN THIS COUNTRY ARE THE FOLLOWING:

BLACK CAYUGA.—Largest solid black duck known. Mature pair weighs fifteen pounds. Body of good length.

COLORED MUSCOVY.—Good size, black and white in color, black predominating. Side of head and region around eyes are without feathers and are carunculated or corrugated and scarlet. Builds her nest and never scatters her eggs. Never quacks. Active on wing.

WHITE MUSCOVY.—Same as colored muscovy except that it is pure white.

INDIAN RUNNER.—Head long and flat, light fawn in color, cap and cheek markings light fawn, bill straight, green with black bean at tip, eyes hazel, neck white from head to beginning of breast markings, back, light fawn or gray, breast light fawn, body light fawn, rear half white. Shanks and feet orange-yellow. Carriage very erect. Small size.

PEKIN.—Largest white duck in existence. Specimens weigh as high as ten or twelve pounds. Head and beak long and of good size, beak orange-yellow, back, breast and body long, broad and deep, with deep keel. Creamy white.

ROUEN.—Largest and most popular of all colored market varieties. Weight nine pounds for drakes, eight pounds for ducks.

WHITE CRESTED.—Medium-sized white duck with large white crest or topknot, about two-thirds the size of Pekin, which it resembles in color and shape of body, except crest.

Goose (*Anser domesticus*).—The goose has been but slightly changed from the parent wild stock by domestication. The feet are short and completely webbed; the hind-toe is present; and the legs are placed comparatively far forward, so that the movements on land are less awkward than those of most ducks. Geese swim little, and never dive.

In general, geese spend much of their time on land, feeding on grass and other herbage, berries, seeds, and other vegetable food. Although large birds, and of bulky form, they have great powers of flight. They strike with their wings in fighting, and there is a hard, callous knob or tubercle at the bend of the wing, which in some species becomes a spur.

The domestic goose is regarded as deriving its origin from the common wild goose, but all the species seem capable of domestication.

Geese are valuable for eggs, quills, feathers, and for food. In southern Europe culture was formerly much more important, but it is still a great industry in Holland and Germany. Livers from geese artificially fattened, in districts near Strassburg, are made into the celebrated delicacy known as *paté-de-fois-gras*. In the United States, goose raising is of minor importance. They are most extensively grown in the Southern States; Kentucky, Missouri, Texas, Tennessee, and Arkansas leading in the order named.

THE CHIEF BREEDS RAISED ARE THE FOLLOWING;

AFRICAN.—Large head with pronounced black knot and heavy gray dewlap under throat. Neck long, back broad and flat, breast full and round, body large and upright, thighs short and plump. Shanks medium length and dark orange color.

Wings of good size, close fitting. General color gray. Mature gander twenty pounds, goose eighteen pounds.

EMBDEN.—Color white. Square, compact body. Neck long and massive appearing, large head. Medium-size orange colored bill. Back slightly arched, breast round, deep and full. Shanks short, stout, deep, orange color, thighs strong, wings large, tail short. Eyes bright blue. Mature gander twenty pounds, goose eighteen pounds.

TOULOUSE.—Blue-gray in color, marked with brown. Head large but short, bill short and stout, neck medium long, body compact, medium length, deep, belly almost touching ground, back broad, slightly arched, breast broad and deep, wings large, strong, close fitting, tail short. Adult gander twenty pounds, goose eighteen pounds.

WHITE AND BROWN CHINESE.—Bodies plump and round, covered with coat of soft feathers and fine down. Medium size, mature specimens weighing ten to fourteen pounds. Long arch necks, with large round knob at base of beak. Short erect body and carriage.

Guinea Fowl (*Numida*) belongs to a genus of African birds in the pheasant family. The plumage is dark gray, with round spots of white, generally larger on the back and under surface. Some species are adorned on the head with a helmet or horny casque, while others have fleshy wattles on the cheeks and a tuft or top-knot on the crown.

The best known is the common guinea fowl (*N. meleagris*), also popularly known as "Comeback," from its cry, with naked head, hard callous casque, and slate-colored plumage, everywhere speckled with round white spots of various sizes. The guinea fowl is now common in the poultry-yards, although it is more adapted to warm than to cold climates. The eggs are small, and have a thick, strong shell, but are particularly esteemed. The flesh is somewhat like a pheasant's, but rather dry.

Ostrich (*Struthio*). A bird which was once included with the cassowaries, emu, rhea and apteryx in a distinct order, but which is probably better regarded as forming a separate family. Its nearest allies appear to be the rheas of South America.

An adult male may reach a height of eight feet, the neck being about three feet long. The special peculiarity is the reduction of the toes to two, these corresponding to the third and fourth of the typical foot. The foot and tarsus are both stout; the head is small, with large eyes, and short, broad, and depressed beak; the wing and tail feathers are large and soft, and have broad, equal vanes; while the long neck is practically naked. The feathers are without an aftershaft.

The true ostrich is a native of Africa. All are flightless birds, and as the wing muscles are reduced there is no keel on the breastbone. The African ostrich has but two toes, the others three. The rheas and the emus may be dismissed with mere mention, the rheas furnishing the feathers used in feather dusters. The African ostriches furnish the well-known plumes and are bred for the purpose, the export of feathers from South Africa amounting to over five million dollars a year. There are now ostrich farms in South America, California, Arizona and Florida. The eggs are laid in the sand and in nature are incubated by the heat of the sun. The plumes are cut (not pulled out) once a year.

Parrot (*Psittacus erithacus*) is a type of an important group of birds, divided into numerous families including the love-birds, macaws, cockatoos and porakeets. They are preeminently tropical birds, and arboreal in habit; some species, however, range into colder countries—*e. g.*, Patagonia and New Zealand—and some, such as the burrowing ground parrot of New Zealand, are not arboreal. They are fruit and seed eating birds, with the exception of the kea, of New Zealand, which has taken to a carnivorous diet.

As a rule, the parrots are brightly colored birds, being often, like other forest-frequenting creatures, green; there are some species, however, which are not brilliantly colored. There is occasionally a difference of color in the two sexes, which is best marked in species belonging to the genus *Eclectus;* in these the prevailing color of the female is red, and of the male green.

Their power of imitating human speech is very remarkable, and equalled by no other animal. The great age to which parrots will live has often been exaggerated, but it is at any rate certain that some species will survive for fifty years in confinement. They are highly regarded by natives of central America as household pets, where they are also used for food and the feathers for ornaments. The best talking birds lack the brilliancy of plumage possessed by many other parrots. Their chief use among civilized peoples is as an ornamental bird and household pet.

Peacock (*Pavo*) is allied to pheasants and other game-birds, and includes at least two species—the Indian and Singhalese (*P. cristatus*), and the Malayan (*P. muticus*), inhabiting Java, Borneo, and similar regions. The birds roost in trees, and eat omnivorously—worms, insects, small snakes, seeds, etc. At the pairing season rival males display the well-known beauty of their tail-coverts before their desired mates, and strut about after the fashion of many game-birds. The usual cry is a shrill "p-a-o" and strange noises are made by rattling the quills. The females lay, according to the climatic conditions, from April to October; the eggs, of a brownish color, are numerous (eight to ten), and are laid without a nest in some concealed spot. At first both sexes are alike in plumage, but after a year or so the males gradually acquire their gorgeous feathers, which are perfected about the third year. The Javan peafowl is said to be even handsomer than the familiar species. The flesh and eggs are of good quality though inferior to the domestic fowl, though they are still extensively bred in southeastern Asia for food. The range of the peacock in domestication has been greatly extended in modern times, but its use is restricted to ornamental purposes. The splendor of its plumage is unequaled by any other large bird.

Pigeon (*Columba livia*), including some three hundred species, is distributed in nearly all parts of the world. Most of the domesticated varieties are derived from the rock dove. The mountain witch of Jamaica is one of the most beautiful of birds. The largest member of the group was the dodo, a native of the islands in the Indian ocean, which became extinct

before 1700, partly because it lacked the power of flight. It was somewhat larger than a turkey, with the same external appearance.

In America, as in Europe there are enormous numbers of breeders who devote themselves to what are known as "fancy pigeons," by which term are meant those bred for their special points or characteristics. Of these there is a great and ever-increasing variety. many of which have several distinct colors.

The most important of the domestic pigeons are the common pigeon, the trumpeter, the ruff pigeon, the Jacobin, the Turkish pigeon, the carrier pigeon, which, on account of its great power of remembering localities, is used for carrying messages; the pouter, the tumbler, the turbit, the fantail, and the oriental pigeon. The young pigeons are highly esteemed for their delicate flavor.

The Turtle Dove (*Turtur auritus*) is frequently kept in captivity, as it is the smallest and prettiest of all the family of pigeons.

Swans (*Cygnus*) are swimming birds, closely related to the ducks and geese, with long and slender neck, bill about as long as the head, and with a soft cere. Nine species are known. The American swan (*C. americanus*) breeds in the northern parts of North America, but its winter migrations extend only to North Carolina. The trumpeter swan (*C. buccinator*) is another American species, breeding chiefly within the Arctic Circle, but of which large flocks may be seen in winter as far south as Texas. Australia produces a black swan (*C. atratus*), discovered towards the end of the eighteenth century, rather smaller than the common swan, the plumage deep black, except the primaries of the wings, which are white. The eye is red. The black-necked swan (*C. nigricollis*), perhaps the handsomest bird of the genus, is a South American species, ranging from Chile to the Faulkland Islands.

Turkey (*Meleagris gallipavo*) or common turkey, is a native of North America, where it exists in two forms. The typical form ranges from southern Canada to Florida and eastern Texas, and westward to the edge of the great Plains; farther south, it is replaced by another form (*M. mexicana*), having the tail and its coverts tipped with buffy white, and inhabiting the tablelands of Mexico, and extending north to the southern border of the United States, and south to Vera Cruz. The finest tame turkeys are those of the American bronze breed, which has been created by crossing.

It is our largest domestic fowl, and much prized for food, though neither its eggs nor feathers are used to an important extent. Notwithstanding it is a stupid bird, ranking low in intelligence, the turkey is easily domesticated and the tame birds readily intermingle with the wild ones. While it needs considerable range and is inclined to wander, and therefore is not suited to small farms, it is comparatively easy to rear and stands second to the chicken in the United States, ranking above geese and ducks both in number and value. Texas reports the largest number, and is followed in order by Missouri, Illinois, Iowa and Ohio.

THE FOLLOWING ARE MUCH PRIZED BREEDS

Black.—Plumage pure black. Otherwise same as above.

Bourbon Red.—A kindred variety to the buff, having deep reddish-buff plumage.

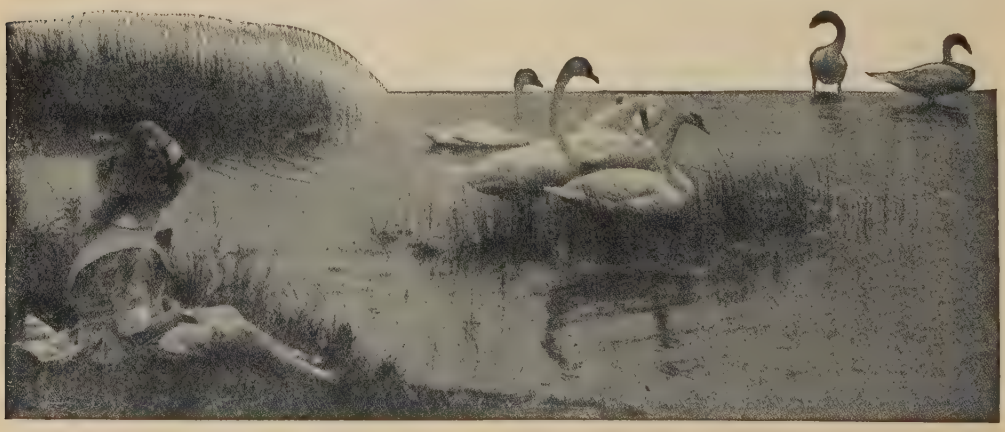
Bronze.—Largest and hardiest of all varieties for the market. Adult cock thirty-six pounds, hen twenty pounds.

Buff.—Feathers a reddish buff, the wing flights being white.

Narragansett.—Plumage bronze and black with a mixture of white. Second in size to bronze. Cock thirty pounds, hen eighteen pounds. General color gray.

Slate.—Plumage of a bluish slate shade. Cock twenty-seven pounds, hen eighteen pounds.

White Holland.—Plumage pure white throughout; has pinkish white shanks. Cocks twenty-eight pounds, hens eighteen pounds.



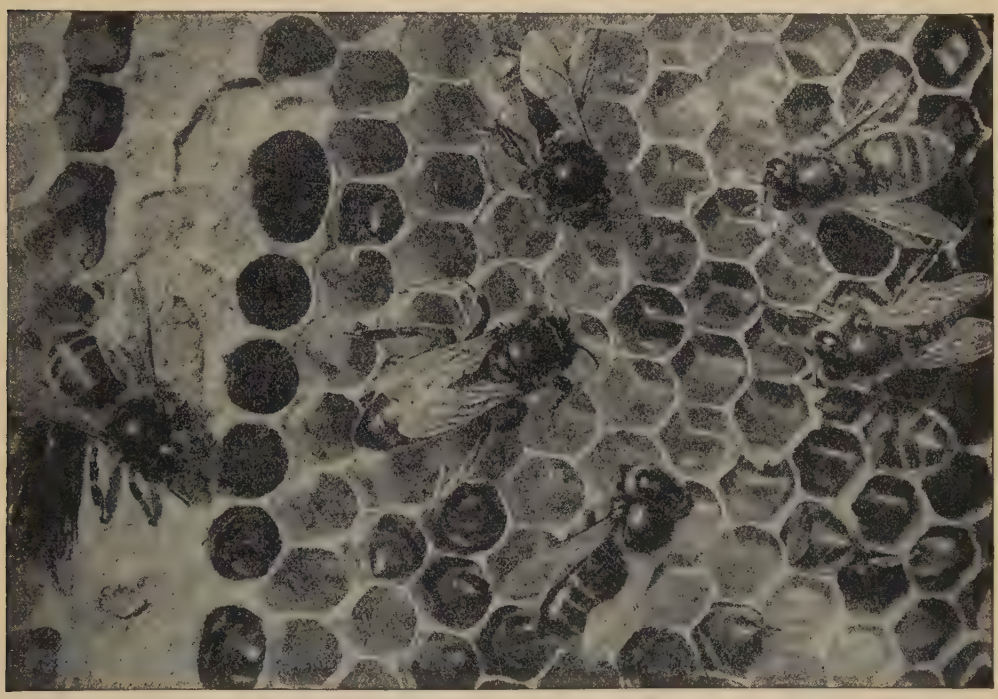
The Swan, on account of its graceful carriage, and beauty of form, is not only a universal favorite with children and grown-ups but has been the subject of much legend and poetry. It was sacred to Apollo, and was the bird of the Muses; and was fabulously celebrated for its melodious song, especially at the time of its death. From the latter legend we derive the expression "swan-song" which means the last effort, or production, or achievement of an individual.

DOMESTICATED INSECTS

Bee, Honey (*Apis mellifica*).—Bees form a family of insects belonging to the same order as the wasps and ants. Many kinds of bees are social, that is to say, they live in communities. As in the case of ants, various sets of members have come to discharge special functions, and the result of this division of labor has been difference of form.

HOW A BEE HOUSEHOLD IS ORGANIZED

Thus the ordinary hive contains (1) a single queen-bee—the fertile female and mother of the next brood, (2) the males or drones, and (3) the vast majority of workers or imperfectly developed females, which only exceptionally become fertile. The working bees constitute essentially the bee community; they are recog-



Her Majesty of the Hive—The worker bees attending on the queen, all with their faces turned toward her. The queen is the large bee in the center. No "swarm" is possible without the commanding presence of an accompanying queen.

As the Honey Bee visits flower after flower she collects pollen as well as nectar. The pollen is largely picked up by the hairy coat, then brushed off by the feet and pressed into the "pollen basket" on the thigh of the hind leg.

nized by their small size, reddish-brown color, and, above all, by the palettes and brushes with which the hind legs are furnished.

The males, or drones, are larger and more hairy than the working bees; they emit a buzzing sound, have no palettes, and no sting. The female, or queen, has a longer body than the workers, and the wings shorter in proportion. The only part she has to play is that of laying eggs, and so she has no palettes or brushes. Only one queen lives in each hive, of which she is perfect sovereign, all the workers submissively obeying her. The number of males is scarcely one-tenth that of the working bees, and they live only about three months.

WHAT THE SWARMING OF BEES MEANS

At a certain time of the year the queen leaves the hive, accompanied by the drones, and takes what is called her "nuptial flight" through the air. About forty-eight hours after her return to the hive she begins laying her eggs, at the rate of about two hundred a day. The eggs which are destined to develop into workers are first laid, then those which are to produce males, and lastly those which give birth to females. The eggs are not long in being hatched, and the larvæ, or caterpillars, which emerge from them are tended by the workers, and fed by them on a peculiar paste, which is apparently a preparation of pollen. In five or six days the larvæ pass into the condition of pupa, or chrysalis, and in about seven or eight days after this the perfect insect is hatched.

A pound weight of bees contain about five thousand individuals, and swarms are often found to weigh eight pounds, or even more. A populous hive will thus contain from forty to fifty thousand bees. In spring, however, the number is much smaller, amounting to only a few thousand.

THE STRUCTURE OF HONEY-BEES

Many of the points in the structure of the honey-bee fit it for the performance of its complex activities. Upon the head there are two large compound eyes, used for near vision, and three small simple eyes, by which objects at a distance can be perceived. There is a well-developed sense of color, and flowers which specially lay themselves out to attract bees are mostly of blue or purple hue. Bees have also a keen sense of smell, which not only attracts them to fragrant flowers, but also helps them to detect the presence of nectar.

THE BEE'S WONDERFUL MOUTH AND LEGS

The mouth-parts of the bee are highly specialized. The powerful first jaws are used in the construction of the comb, and for a great variety of other purposes, while the second and third jaws are drawn out into a long suctorial and licking apparatus. The basal part of this constitutes a tube through which nectar or other sweet fluids can be sucked up, while its terminal portion is a sort of tongue (*ligula*) that can be inserted into the recesses of flowers. This is worked up and down so as to bring nectar within the tubular part of the apparatus. The end of the tongue is expanded into a sort of lappet for licking, and the sharp blades of the second jaws can be used for piercing certain flowers, such as orchids, which contain sweet sap. When not in action, the suctorial parts of the mouth are folded up on the under side of the head, enabling the first jaws to work freely.

HOW THE COAT IS GATHERED FOR THE HONEY-COMBS

There are marked differences between the three pairs of legs of a worker-bee. The first are provided with combs, by which the delicate antennæ are cleaned, while the third are chiefly remarkable for peculiar pollen brushes on the feet, and a depression or "pollen basket" on the outer side of the shin. The hairy feet brush pollen into the baskets, and when of a dry nature a little honey is ejected from the mouth on to the grains, so as to stick them together. Another peculiarity of the third leg is the nature of the joint between shin and foot, which constitutes a sort of pincers useful in manipulating wax.

The wax of which the cells of the honeycomb are constructed is supposed to be secreted by an organ situated in the abdomen, or belly, of the bee; but, in addition to wax, another substance much resembling it, but not identical, called propolis, is elaborated from the juices of certain plants, and employed to line the inner surface of the hive. The cells are hexagonal in shape, that is, having six equal sides—the most economical form as regards space—and are of two kinds, namely, store-cells, which are filled with honey, as a reserve store of food, and cradle-cells, in which the eggs are deposited.

WHERE THE HONEY COMES FROM

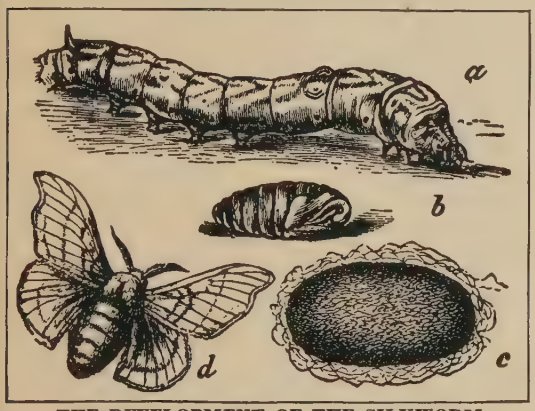
The honey of various regions is flavored by the flowers predominant in the districts where it is gathered—hether, rosemary, lavender, orange-flowers, white clover, bass-wood, lime-tree. In Scotland it is not unusual to transport the hives in the flowering season to the neighborhood of heathery tracts. The honey most famous in the ancient world was that of Mt. Hybla in Sicily, and Mt. Hymettus in Attica. Supplies are imported into Britain from various quarters; but it is to the United States and Canada that we must turn for bee-farming on the largest scale, and California, especially southern California, is the paradise of bee-keepers. Some bee-keepers have from two thousand to three thousand hives; and as much as seven hundred pounds of honey has been obtained from one hive. The most improved hives, honey-extractors, artificial combs, and comb-foundations are in general use.

Silk-worm (*Bombyx mori*) lives on the Mulberry, and is bred for the fibers of the cocoon. It originally came from southern Asia, but is now extensively cultivated in China, Japan and southern Europe for the purpose of obtaining its silk. The cultivation of the silkworm is dependent almost entirely on the supply of these leaves.

HOW THE SILK WORM GROWS AND FEEDS

On the low, moist, alluvial soils of the East, slips of this tree are planted in close and continuous lines, and six to eight weeks afterwards they are six feet high, and the leaf-crop allows

of six to ten broods being produced in the course of six months. In Europe it is not unusual for more than one brood to be produced, and the female lays her eggs towards the end of the summer; but they do not hatch until the following spring, when the leaves appear. In Asia, during the season, the eggs hatch eight to ten days after laying. The caterpillar feeds persistently, and rapidly grows; at the end of a month it moults, and this happens four times in all before it starts to make its cocoon.



THE DEVELOPMENT OF THE SILKWORM

The female moth deposits in July three to five hundred eggs, from which the white caterpillars (*a*) emerge in the following spring, at the period when the white mulberry tree blooms, upon the leaves of which they feed. The caterpillars change their skins four times and are full grown in about a month. They now spin a cocoon (*c*), which is generally completed in three and a half days, and five days later they change into pupæ (*b*). The pupal stage lasts from fourteen to nineteen days. The cocoons furnish the silk, and the pupæ are generally killed on the tenth day by heat.

HOW THE DELICATE SILK FILAMENT IS PRODUCED

The silk is produced from spinnerets, two apertures in the head, the two filaments joining as they appear to form a very strong thread from five hundred to one thousand yards long. This the caterpillar wraps round its body until it is completely covered, and then it passes into the chrysalis state. Unless the grey moth is wanted for egg-laying, the chrysalis is killed by putting the cocoon in a hot oven, for if allowed to appear it cuts through some of the more valuable parts of the silk.

WINDING THE SILK FROM THE COCOONS

The next process is to wind as much as possible off the cocoons into hanks. In Europe and in some Oriental towns this is done with improved machinery in factories called filatures. It is usually begun when the cocoons are fresh. Each operator has before her a basin of hot water, the temperature of which is regulated by a steam-pipe or a fire, and overhead is a reel turning slowly. After removing the outside flossy covering, the operator places the cocoons in the basin, with the result that the hot water softens the natural gum that is in the silk, and allows it to be wound off. The filaments are passed through several glass eyes, and crossed, and thus become glued together into a thread which is called "singles," and when further prepared is known as "thrown silk." The singles are reeled into large hanks being called a "moss," and each bundle a "book."

In this form, Asiatic silk is imported into Europe and the United States. The quantity of such silk obtained from one cocoon is very small—seldom up to a thousand yards, generally not more than five hundred yards. The remainder of the cocoon is either too flossy or too entangled to be wound. This waste portion forms the material from which spun silk is prepared. Five to six hundred cocoons weigh two pounds, and twenty pounds of cocoons yield two pounds of spun silk. The eggs of the silkworm were first brought to Europe by two Christian monks in 555 A. D., who took them in hollow sticks to Constantinople, whence the cultivation of the silkworm rapidly spread to other parts.

SCIENTIFIC TERMS CONCERNING ANIMALS

Abdomen (*ăb-dō'mĕn*).—In mammals, that portion of the body-cavity which is separated from the thorax or chest by the diaphragm. In insects the third or last portion.

Ametabolic (*ȧ-mĕt'a-bŏl'ĭk*).—Referring to insects and other animals which do not undergo a metamorphosis, or change of form.

Amoeba (*ȧ-mē'bȧ*).—One of the Protozoa that is continually changing its shape.

Amorphous (*ȧ-mŏr'fŭs*).—Without a definite figure; shapeless; especially applicable to sponges.

Amphibia (*ăm-fĭb'ĭ-ȧ*).—A class of vertebrates, breathing in water while young and in air when mature. The term amphibious is applied to fishes, molluscs, etc., that are capable of changing the nature of their respiration at will.

Annelida (*ăn-nĕl'ĭ-dȧ*).—Articulate animals whose bodies possess no jointed members, as the leech, and worm tribe.

Annulate (*ăn'ū-lāt*).—Animals whose bodies are composed of a series of ring-shaped divisions.

Anthropoid (*ăn-thrō-poid*).—The highest order of apes.

Apterous (*ăp'tĕr-ŭs*).—Destitute of wings.

Arachnida (*ȧ-răk'nĭ-dȧ*).—Articulate animals with legs, but without wings, including spiders, mites, scorpions, etc.

Arthropoda (*ăr-thrŏp'o-dȧ*).—Articulated animals with jointed feet, as crabs, insects, etc.

Asexual (*ȧ-sĕks'ū-al*).—A term applied to animals, as Aphis, in which the reproductive organs are imperfect, and the young are produced by budding.

Auricle (*ȧ'rĭ-k'l*).—The cavity of the heart which receives the blood and transmits it to the ventricle.

Bacteria (*băk-tē'rĭ-ȧ*).—Microscopic vegetable organism, belonging to the class Algæ, usually in the form of a jointed, rod-like filament, and found in putrefying organic infusions. Bacteria are destitute of chlorophyll, and are the smallest of microscopic organisms. They are very widely diffused in nature, and multiply with marvelous rapidity. Certain species are active agents in fermentation, while others appear to be the cause of certain infectious diseases.

Batrachia (*bȧ-trā'kĭ-ȧ*).—Applied to frogs, toads, and salamanders.

Bimana (*bĭm'ȧ-nȧ*).—Two-handed animals whose posterior extremities are used only to keep them in an erect position, and for the purpose of locomotion. They comprise the varieties of man.

Blastoderm (*blăs'tō-derm*).—The outer layer of the germ-cells of the embryo.

Carapace (*kăr'ȧ-pās*).—A sort of shell which protects and encloses the bodies of tortoises and some reptiles, etc.

Carnivora (*kär-nĭv'ô-rȧ*).—Group of mammals, including the lion, tiger, wolf, bear, seal, etc. They feed upon flesh, though some of them, as the bears, also eat vegetable food. The teeth are large and sharp, suitable for cutting flesh, and the jaws powerful.

Carnivorous (*kär-nĭv'ô-rus*).—Eating or feeding on flesh. The term is applied to animals which naturally seek flesh for food, as the tiger, dog, etc.

Cephalopoda (*sĕf-a-lŏp'ô-dȧ*).—The highest class of Molluscs.

Cetacea (*sē-tā'shē-ȧ*).—The whales.

Chiroptera (*kī-rŏp'te-rȧ*).—The bats.

Chrysalis (*krĭs'ȧ-lĭs*).—The pupa state of an insect.

Coelenterata (*sē-lĕn'te-rā'tȧ*).—The group of Invertebrates, comprising hydrozoa and actinozoa.

Coleoptera (*kol-e-op'ter-a*).—The beetles.

Cilia (*sĭl'ĭ-ȧ*).—Hair-like organs of Infusoria. Microscopic filaments attached to cells, usually within the body, and moving usually rhythmically.

Crustacea (*krŭs-tā'shē-ȧ*).—Applied to lobsters, crabs, etc.

Dipnoi (*dĭp'nô-ī* or *-noi*).—An order of fishes.

Diptera (*dĭp'tē-rȧ*).—Two-winged flies; an order of insects.

Echinodermata (*e-kī'nô-dĕr'mȧ-tȧ*).—Applied to the sea-urchin, a subdivision of animals.

Edentata (*ē'dĕn-tā'tȧ*).—Those animals having imperfect dental apparatus. Their digits, too, are generally sunk in large and crooked claws.

Elasmobranchii (*ē-lăs'mō-brănk-ē*).—The sharks and rays.

Fauna (*faw'nȧ*).—The native animals of a certain locality.

Flagellum (*flȧ-jĕl'lŭm*).—A whip. The appendage of some Protozoa.

Foraminifera (*fô-răm'ĭ-nĭf'e-rȧ*).—Animals with perforated shells.

Ganoid (*gā'noid* or *găn'oid*).—Applied to a certain class of fish.

Gasteropoda (*găs'te-rŏp'ô-dȧ*).—A class of Molluscs. Some of them form shells, while others are destitute of them,—as the slug, snail, etc.

Grallatores (*grăl'lȧ-tō'rēz*).—Wading-birds.

Hibernation (*hī-bĕr-nā'shŭn*).—The state of animals that sleep throughout winter.

Hymenoptera (*hī-mē-nŏp'te-rȧ*).—An order of insects with two pairs of membraneous wings.

Ichthyology (*ĭk-thĭ-ŏl'ô-jy*).—The science of fishes, or that part of zoology which treats of fishes, their structure, habits, etc.

Infusoria (*ĭn'fū-sō'rĭ-ȧ*).—Minute animals that live in stagnant water. A class of Protozoa.

Insectivora (*ĭn'sĕk-tĭv'ô-rȧ*).—Insect-eaters. They comprise the shrew, mole, hedgehog, etc.

Invertebrate (*ĭn-vĕr'te-brāt*).—Animals that have no vertebral column, or bones properly so called.

Larva (*lär'vȧ*).—The second stage of the insect, a caterpillar, grub, or maggot.

Mandible (*măn'dĭ-bl*).—The upper jaw of insects; the lower jaw of vertebrates.

Marsupial (*Mär-su'pĭ-al*).—An order of mammals that carry their young in a pouch, as the kangaroo.

Mollusc (*mŏl'lŭsk*).—Animals whose bodies are soft and pulpy.

Monotremata (*mon-ō-trē'ma-ta*).—An order of mammals having the intestine and the ducts of the urinary and genital organs open into a common orifice.

Myriapoda (*mĭr-ĭ-ŏp'ô-dȧ*).—A class of arthropoda. Articulate land animals having many legs, as the centipede.

Natatores (*nā'tȧ-tō'rēz*).—An order of birds that swim.

Neuroptera (*nū-rŏp'tĕ-rȧ*).—An order of insects with four membraneous wings, as dragon-flies.

Nocturnal (*nŏk-tŭr'nal*).—Of the night. Nocturnal birds are birds that fly abroad during the night only.

Notochord (*nō'tô-kôrd*).—A primitive backbone.

Omnivorous (*ŏm-nĭv'ô-rŭs*).—Living on both vegetables and flesh.

Orthoptera (*ôr-thŏp'tē-rȧ*).—An order of straight-winged insects, as cockroaches, grasshoppers, etc.

Oviparous (*ō-vĭp'ȧ-rŭs*).—Applied to animals which produce eggs instead of living young.

Ovipositor (*ō'vĭ-pŏz'ĭ-tĕr*).—In insects an organ by which eggs are deposited in wood, etc.

Pachydermata (*păk'ĭ-dĕr-mȧ-tȧ*).—A group of hoofed mammals distinguished for the thickness of their skins, including the elephant, hippopotamus, rhinoceros, tapir, horse, and hog.

Pelagic (*pē-lăj'-ĭk*).—Living on the high seas, away from the coast; in mid-ocean.

Polyp (*pŏl'ĭp*).—Separate coral animals.

Protoplasm (*prō'tô-plāz'm*).—The albuminous, elementary matter forming cells and the body-substance of Protozoa.

Protozoa (*prō'tô-zō'ȧ*).—The lowest forms of animal life.

Pupa (*pū'pȧ*).—The third, or usually quiescent, chrysalis stage of insects.

Paleontology (*pā-lē-ŏn-tŏl'ŏ-gy*).—The science of ancient beings or creatures; applied to the science of the fossil remains of animals and plants now extinct.

Quadrumana (*kwŏd-rōō'mȧ-nȧ*).—Monkeys.

Quadruped (*kwŏd'ru-pĕd*).—Four-footed animals.

Radiates (*rā'dĭ-āts*).—Animals having a central mouth, around which the body forms a star-shaped figure.

Ratitæ (*rȧ-tī'tē*).—A division of birds with a keelless, raft or punt-like sternum.

Rhizopoda (*ri-zŏp'ô-dȧ*).—The root-footed Protozoa.

Rodentia (*rô-dĕn'shĭ-ȧ*).—An order of animals which gnaw.

Rotifera (*rô-tĭf'ĕ-rȧ*).—An order of crustacea with a pair of ciliated appendages in motion, resembling wheels.

Ruminantia (*roo-mĭ-năn'shĭ-ȧ*).—The cloven-footed quadrupeds. Those that chew the cud. They have cloven feet, want incisors, and have a stomach with four cavities.

Taxidermy (*tăks'ĭ-dĕr-my*).—The art of preparing and preserving specimens of animals.

Teleostei (*tē'lē-ŏs'te-ī* or *tĕl'e*).—An order including most of the bony fishes.

Thorax (*thō'rāks*).—The chest of vetebrates, the middle portion of insects, etc.

Ungulata (*ŭn-gū-lā-tȧ*).—The order of hoofed mammals.

Vertebra (*vĕr'tē-brȧ*).—One of the bones of the spinal column.

Vertebrates (*vĕr'te-brȧts*).—Animals provided with vertebræ. One of the grand divisions of the animal kingdom, comprising all animals that have a backbone composed of bony or cartilaginous vertebræ, together with those in which the backbone is represented by a simple undivided notochord.

Viviparous (*vi-vĭp'ȧ-rŭs*).—Applied to animals which bring forth their young alive.

Zoophyte (*zō'ô-fīt*).—Applied to the animals which resemble plants, such as the sea-anemones, sponges, etc.

BOOK OF RACES AND PEOPLES

HOW MAN DIFFERS FROM OTHER ANIMALS
MAN AND THE HUMAN FAMILY
MAN'S ORIGIN AND PRIMEVAL HOME
OLDEST EXTANT REMAINS OF THE HUMAN RACE
CHART OF MAN'S ADVANCEMENT THROUGH THE AGES:

(1) Dawn Stone Age
(2) Old Stone Age
(3) New Stone Age
(4) Bronze Age
(5) Early Iron Age
(6) Late Iron Age
(7) Age of Letters

HOW THE RACES ARE CLASSIFIED
PHYSICAL AND MENTAL RACE CHARACTERISTICS
GEOGRAPHICAL DISTRIBUTION OF THE RACES
DICTIONARY OF THE HISTORICAL RACE GROUPS
COMPARATIVE CLASSIFICATION OF RACES AND PEOPLES

RACE TYPES OF WOMANKIND THE WORLD OVER

CHINESE
(Yellow)

JAPANESE
(Yellow)

SIAMESE
(Yellow)

BURMESE
(Yellow)

MAORI
(Brown)

SAMOAN
(Brown)

JAVANESE
(Brown)

SIBERIAN
(Yellow)

ARABIAN
(White)

EGYPTIAN
(White)

BERBER
(White)

NUBIAN
(Black)

INDIAN
(Red)

ESKIMO
(Red)

SUDANESE
(Black)

ZULU
(Black)

BOOK OF RACES AND PEOPLES

MAN, though a member of the animal kingdom, is so superior and distinctive that he must be set entirely apart for special consideration. The branches of knowledge or science, concerning his nature, origin and development are of the highest importance to us because of their relation to our very selves as part of the great family of Mankind. Strictly speaking, there can be but *one* science of man—*Anthropology*—but the various parts of this *supreme* science have received various district names. (1) Man as an *animal* belongs to *Biology* and *Zoology;* (2) his *structure* and *functions* belong to *Anatomy* and *Physiology;* (3) his *mind* falls under *Psychology;* (4) the facts and theories as to his *speech* and *language* come under *Philology;* (5) the study of the various *races,* their origin, physical and mental differences, migrations, and geographical distribution, falls under *Ethnology;* and (6) *human culture,* or civilization, which includes government, social institutions, customs and usages, traditions, folklore, religion, etc., belong to *Sociology*. In a certain sense, Anthropology also includes *History*, which is the record of the *doings* of *civilized* man in the order in which they occurred; but this branch of knowledge is so vast in itself that it is usually assigned a province of its own.

MAN AND THE HUMAN FAMILY

IN THE colorless language of science, man is classed under the order Primates (Lat., *primus*, first) and suborder Bimana (Lat., *bis*, twice; *manus*, a hand) which means a two-handed animal. Although the contrast between man and other animals is more distinct among the higher members of the human species, it may be traced in all. It is less of degree than of kind, and is rather intellectual and spiritual than physical.

In size man is dwarfed by numerous animals; in strength he is no match for some that do not attain his proportions. He is short-sighted compared to the eagle; deaf compared to the hare; and almost without the sense of smell compared to the wild dog or the vulture, who perceives the faintest scent borne to it upon the breeze.

HOW MAN DIFFERS FROM OTHER ANIMALS

In adult life man is unique in his erect posture, and in the freedom of his hands from any direct share in locomotion. His body is usually naked, his canine teeth are not longer than their neighbors, his thumbs are larger than those of monkeys, and his feet are distinguished by the horizontal sole which rests flatly on the ground. His face is notably more vertical than that of apes, lying below rather than in front of the forepart of the brain-case; the jaws, the orbits, and the ridges above them are relatively smaller; the nose-bones project more beyond the upper jaw; and the chin is more prominent than in other Primates.

BRAIN-POWER THE SUPREME DIFFERENCE

Probably the most important difference between man and other members of the same or any order, is the higher physical development of the brain. Not only is the size greater in proportion to the rest of the body, but it presents a more elaborate series of folds, or convolutions. When it is understood that the physical processes corresponding to the highest mental activities are located in the cortex, or rind of the brain, it is seen that the extent and number of the convolutions, by increasing the area of the cortex, must play a considerable part in determining the intellectual effectiveness of the animal.

In addition to mere size of brain, may be noted the adaptability of his hands to many uses, allowing a degree of skill impossible to other animals. The senses, too, are so nicely balanced and accurately adjusted as to enable him to obtain an intimate acquaintance with the properties of the world around him, in a manner that will contribute to his pleasure, and at the same time ensure his elevation and happiness. He possesses the gift of language by which to denote his wants; the colors of the earth and sea and sky gladden his eye; melody enchants his ear; the sweet odors of flowers delight his nostrils; the fruits of summer please his palate; the glorious sun and the spangled canopy of heaven entrance him—and all lead him to the contemplation of the Deity, of whose wondrous scheme he is himself the corner-stone.

When differences other than physical are considered, the superiority of man is so great as to incline many to the opinion that he is a separate creation on the ground of his mentality alone.

However great this superiority is, it does not appear that man possesses any faculty or fairly fundamental mental process which is not possessed in some degree by some lower animal or other. Memory, the powers of abstraction, and of reasoning are possessed by certain animals, if only in a very simple form.

He alone can produce fire; and this acquaintance with fire and the art of cooking has also frequently been regarded as the most distinctive characteristic of the human race. Clothing and decoration are also early peculiarities of man. Alone among animals, he covers himself with the skins of the beasts he has slain, and adorns himself with feathers, shells, teeth, and bones. Yet from these simple beginnings all the arts gradually developed.

MAN AND HIS DEAD

Man is one of the few animals to pay special attention to his dead. Funeral rites differ much from place to place, and form a special subject of anthropological study. Tumuli, pyramids, standing-stones, and other forms of funeral monument have each their history and implications. Especially does man almost everywhere believe in some sort of survival of the individual after death, and in the existence within himself of a soul or spirit which outlives its fleshly habitation. The origin of religion is largely connected with these ideas of a future life and a future world. Herbert Spencer traces it directly to the theory of hosts and ancestor-worship; Dr. Tylor, to what he calls animism, or the belief in souls universally pervading all natural objects.

Man alone also wilfully indulges in intoxicating, stupefying, or exciting substances, such as alcohol, tobacco, bhang, opium, hashish, etc.

THE GREAT QUESTION OF MAN'S ORIGIN

As to man's origin, two main views may be said at present to contest the field. Has man sprung from a single or from several stocks? Do the races of men constitute so many members of *one* family, or are they *four* or more unrelated groups? One answer, formerly the accepted one, is based either upon the literal interpretation of Scripture or upon natural theology, and regards him as a distinct creation, separate from and superior to the remaining animals. The other, accepted by many competent authorities, regards him as descended from a hairy ancestor, more or less remotely allied to the anthropoid apes. This theory of his antecedents has been elaborated in profuse detail by Charles Darwin, whose *Descent of Man* forms the great storehouse of information and speculation on the question. In the beginning, according to the evolutionary view, man was apparently homogeneous —a single species, speaking a single primitive rude tongue (largely eked out by signs and gesture-language), and not divided into distinct varieties. At an early period, however, the species broke up into several races, now inhabiting various parts of the world.

MAN'S PRIMEVAL HOME AND HIS EARLIEST KNOWN REMAINS

If man is therefore essentially one, he cannot have had more than one primeval home. This human cradle, as it may be called, has been located with some certainty in the Eastern Archipelago, and more particularly in the island of Java, where in 1892 Dr. Eugene Dubois brought to light the earliest known remains that can be described as distinctly human. From the Pliocene (late Tertiary) beds of the Trinil district he recovered some teeth, a skull, and a thigh-bone of a being whom he named the *Pithecanthropus erectus*, thereby indicating an "Ape-man that could walk."

In this "first man," as he has been designated, the erect position, shown by the perfectly human thigh-bone, implies a perfectly prehensile (grasping) hand, with opposable thumb, the chief instrument of human progress, while the cranial capacity suggests vocal organs sufficiently developed for the first rude utterances of articulate speech.

PROBABLY THE FIRST MIGRATIONS OF MAN

The Javanese man was thus already well equipped for his long migrations round the globe. Armed with stone, wooden, bone, and other weapons that lay at hand, and gifted with mental

THE OLDEST EXTANT REMAINS OF THE HUMAN RACE

APE-MAN OF JAVA (*Pithecanthropus erectus*) as restored from the remains found by Dr. Dubois in Java in 1892. It is estimated that he lived at least 500,000 years ago.

PILTDOWN MAN of Sussex, England, whose antiquity is thought to be over 100,000 years. This restored model indicates a marked progress in type and intelligence.

NEANDERTHAL MAN whose remains were found in central France. It is probably a type of a hunting race existent more than 25,000 years ago.

CRO-MAGNON MAN skeletons of which type were found in the grotto of Cro-Magnon, Vézère valley, France, in 1868. Supposed antiquity, 12,000 years.

powers far beyond those of all other animals, he was assured of success from the first. He certainly had no knowledge of navigation; but that was not needed to cross inland seas, open waters, and broad estuaries which, indeed, did not exist in Pliocene and later times. The road was open across the Indian Ocean to Madagascar and South Africa by the now submerged Indo-African Continent. The Eastern Archipelago still formed part of the Asiatic mainland from which it is separated even now by shallow waters, in many places scarcely fifty fathoms deep. Eastwards the way was open to New Guinea, and thence across Torres Strait to Australia and thence to the Islands of the Pacific Ocean. In the northern hemisphere Europe could be reached from Africa by three routes, one across the Strait of Gibraltar, another between Tunis, Malta, Sicily and Italy, and a third from Cyrenaica across the Ægean to Greece, and the British Isles from Europe via the Strait of Dover and the shallow North

Sea. Lastly, the New World was accessible both from Asia across Bering Strait, and from Europe through the Orkneys, the Shetlands, the Faroes, Iceland, and Greenland. Here were, therefore, sufficient land connections for early man to have gradually spread from his Javanese cradle to the uttermost confines of the habitable globe.

WHEN THE WORLD WAS FIRST PEOPLED

Much trustworthy evidence has been collected to show that the whole world had really been peopled during the period which roughly coincides with what is known in geology as the Ice Age; that is, when a large part of the northern and southern hemispheres was subject to invasions of thick-ribbed ice advancing successively from both poles. The migrations were most probably begun before the appearance of the first great ice-wave, then arrested and resumed alternately between the glacial intervals, and completed after the last glacial epoch, say, some two or three hundred thousand years ago.

At that time the various wandering groups had already made considerable progress both in physical and mental respects, as is seen in the Neanderthal skull, which is the oldest yet found in Europe, standing about midway between the Javanese ape-man and the present low races. All were still very much alike, presenting a sort of generalized human type which may be called Pleistocene man, a common undeveloped form, which did not begin to specialize—that is, to evolve the existing varieties until the several primitive groups had reached their respective homes as disclosed at the dawn of history.

EVIDENCES OF MAN'S ADVANCEMENT IN PREHISTORIC AGES

From human remains, weapons, tools and other vestiges of human activity, found in the more recent deposits on the earth's surface, the presence of man in these far off ages is made increasingly certain. The Pleistocene or Quaternary epoch, as represented by these objects of primitive culture, ranged over a vast period of time which has been conveniently divided into two great epochs, the Paleolithic or Old Stone, and the Neolithic or New Stone Age, these being so named from the material chiefly used by primitive peoples in the manufacture of their weapons and other implements. The distinction between the two periods, which are not to be taken as chronological, since they overlap in many places, is based essentially on the different treatment of the material, which during the immeasurably longer Old Stone Age was at first merely chipped, flaked, or otherwise rudely fashioned, but in the New more carefully worked and polished.

MAN IN THE OLD STONE AGE

Evidence is, however, that it is not always possible to draw any clear line between the Old and New Stone Ages. In one respect the former was towards its close even in advance of the latter, and quite a "Paleolithic School of Art" was developed during a long period of steady progress in the sheltered Vézère valley, of South France. Here were produced some of those remarkable stone, horn, and even ivory scrapers, gravers, harpoons, ornaments and statuettes with carvings on the round, and skilful etchings of seals, fishes, reindeer, harnessed horses, mammoths, snakes, and man himself, which also occur in other districts.

In Tunisia many implements lie under a thick bed of Pleistocene limestone deposited by a river which has since disappeared. The now absolutely lifeless Libyan plateau is strewn with innumerable worked flints, showing that early man inhabited this formerly fertile region before it was reduced by the slowly changing climate to a waste of sands. The same story of man's great age is told by discoveries in Burma, India, North and especially South America, and now also in Great Britain.

MAN IN THE NEW STONE AGE

Outstanding features of the New Stone Age are the Swiss and other lake-dwellings, the Danish peat-beds with their varied contents, the shell-mounds occurring on the seaboard in many parts of the world.

In the more civilized regions, such as Egypt, Babylonia, parts of Asia Minor, and the Ægean lands, the Stone Ages were at an early date followed by a period vaguely designated as "prehistoric," during which stone as the material

1 to 29.—Implements of the Stone Age. 30 to 48.—Implements of the Bronze and Early Iron Ages. 49 to 60.—Implements of the Late Iron Age.

of human implements was gradually replaced by the metals, first copper, then various copper alloys (arsenic, sulphur, nickel, cobalt, zinc, and especially tin) generally called bronze, lastly iron.

Thus were constituted the so-called Metal Ages, during which, however, overlappings were everywhere so frequent that in many localities it is quite impossible to draw any well-marked dividing lines between the successive metal periods. Indeed a direct transition from Stone to Iron may be suspected in some places, and in any case the pure copper period appears to have nowhere been of long duration except in America, where there was no iron and little bronze.

THE AGE OF LETTERS OR PICTOGRAPHS

Besides the metals, letters also, or at least pictorial writings such as the old rock carvings of Upper Egypt, were introduced in the Prehistoric Age, which comprises that transitional period dim memories of which lingered on far into historic times. It was an age of popular myths, folklore, demi-gods, heroes, traditions of real events, and even philosophic theories on man and his surroundings, which supplied ready to hand the copious materials afterwards worked up by the early poets, founders of new religions, and later lawgivers.

So also in China the early historians still remembered the still earlier "Age of the Three Rulers," when people lived in caves, ate wild fruits and uncooked food, drank the blood of animals, and wore the skins of wild beasts (our Old Stone Age). Later they became less rude, learned to obtain fire by friction, and built themselves habitations of wood and foliage (our New Stone Age).

Of strictly historic times the most characteristic feature is the general use of letters, most fruitful of human inventions, since by its means everything worth preserving was perpetuated, and

This is an inscription in hieroglyphic writing found at Meidum, Egypt. It records the life events of King Rahotep and his Queen Nefert.

Here is an Egyptian pictograph representing the Nubians bearing gifts to the King of Egypt.

all useful knowledge thus tended to become accumulative. Writing systems, as we understand them, were not suddenly introduced, but gradually evolved from pictures representing things and ideas to conventional signs or symbols which first represent words, as in the Chinese script and our ciphers, and then articulate sounds, as in our alphabet. Between the two extremes—the pictograph and the letter—there are various intermediate forms, such as the rebus and the full syllable, and these transitional forms are largely preserved both in the Egyptian and Babylonian systems, which thus help to show how the pure phonetic symbols were finally reached. That was probably six thousand years ago, since we find various ancient scripts widely diffused over the Greek Archipelago (Crete, Cyprus, Asia Minor) in very early times. The hieroglyphic and cuneiform systems whence they originated were very much older, since the rock inscriptions of Upper Egypt are prior to all historic records, while the Mesopotamian city of Nippur already possessed half-pictorial, half-phonetic documents some six thousand years before the New Era.

From the pictorial and plastic remains recovered from these two earliest seats

DEVELOPMENT OF THE HUMAN RACE THROUGH THE AGES

This chart falls within the **Cenozoic** (*sē'no-zō'ik*), or "Recent life," Period of the Earth and should be compared with it. Estimated Age of the Cenozoic Period, 3,000,000 years.

Geological Epochs of the Earth		Successive Upward Stages in the Development of Civilized Man		Estimated Time and Duration of Periods
Quaternary (*Kwä-ter'na-rĭ*) or "Fourth" Sedimentary System of the Earth. Age of Man.	**Recent** or Alluvial Epoch; called by Geologists **Holocene** (*hō'-lo-sen*)	**Historic Period.**—Rise of Civilization through the gradual organization of mankind into social groups and nations, for the protection of life, liberty and property and the advancement of the arts, sciences and religion.	**Age of Letters** or Pictorial Writing..... This period offers an unbroken record of events from the first dated monuments and documents down to the present day. With the discoveries of archæologists in Babylonia, Egypt, Southern Arabia, and the Ægean lands, the beginnings of historic times are constantly receding farther into the background, and to the Mesopotamian city of Nippur is already ascribed an antiquity of about eight thousand years.	800 B. C. to Present Time
			Late Iron Age..... In this age man begins to bestir himself towards discovery and invention. He organizes into tribes, makes laws, records observations—in fact, develops into nations such as manifest themselves on the earliest monuments of Egypt and Babylonia. In Europe it is characterized by forms of implements, weapons, personal ornaments, and pottery, and also by systems of decorative design, which are altogether different from those of the Bronze Age.	In Europe, 500 B.C. to Roman times.
			Early Iron Age, or Hallstatt Period..... The earliest evidence of this age was found near Hallstatt, in Upper Austria, in a famous Celtic burial-ground. The excavations here yielded swords, daggers, javelins, spears, helmets, axes, shields, and various forms of jewelry, also amber and glass beads; silver was apparently not known. Most of the weapons were of iron, only a few being of bronze.	In Europe, 100 to 500 B. C. In Orient 1800 to 1000 B. C.
			Bronze Age..... Here flint is cast aside, and gold as an ornament begins to attract him. This was the stage reached by the Aztecs and the aborigines of Peru when discovered by Europeans in the early sixteenth century. The implements and weapons include knives, saws, sickles, awls, gouges, hammers, anvils, axes, swords, daggers, spears, arrows, shields. The forms of each class differ in different areas, and vary with advancing time. The workmanship is always of a very high order, the shapes graceful, and the finish fine.	In Europe, 2000 to 1000 B. C. In Orient 4000 to 1800 B. C.
	Pleistocene (*plīs'to-sēn*) or Glacial Epoch		**New Stone Age** or Neolithic (Gr., *neos*, new; *lithos*, stone) The Neolithic implements occur in river-terraces, alluvial deposits, lake dwellings and caves. The weapons and tools were made of highly polished stone. With the relics of Neolithic man are found remains of the Irish elk, the reindeer, beaver, brown bear, etc. Besides these were the remains of domesticated forms such as the cat, horse, sheep, dog, and goat. The tribes were acquainted with agriculture, and were advanced in the arts of weaving and pottery-making.	In Europe, about 12,000 to 3000 B.C. **Cro-Magnon, and Grimaldi Races** (about 10,000 B. C.)
		Pre-historic Period.—Dawn of mind, industry and art. This period merged imperceptibly into the more strictly historic period when letters were introduced.	**Old Stone Age** or Paleolithic (Gr., *palaios*, ancient; *lithos*, stone)..... The men of this age were hunters, and the remains of successive hunting races have been found in the deposits of caves, river gravels, and other sediments. They used rude hatchets and other implements of rough, unpolished stone which occur in association with relics of northern (mammoth, reindeer, cave-bear) and southern mammalia (lion, leopard, hippopotamus). The walls of their caves are covered with rough sketches of animals belonging to that period. The men who inhabited the caves of Europe in Paleolithic time were very similar to the modern Eskimo.	In Europe, about 125,000 to 12,000 B. C. **Neanderthal Man** (about 25,000 B.C.) **Piltdown Man** (about 110,000 B.C.)
			Dawn Stone Age, or Eolithic..... Primitive man existed even earlier than paleolithic man. It is certain that, in order that man possess the necessary skill exhibited in the flint implements, he must have passed through a previous and necessarily less skillful stage. Evidences of this period have been claimed to exist in the Plateau-gravels of Kent, Belgium and Egypt.	About 525,000 to 125,000 B. C. **Heidelberg Man** (about 250,000 B.C.) **Pithecanthropus** (about 475,000 B.C.)
Tertiary (*ter-shi-a-rĭ*); or "third." Age of mammals.	**Pliocene** (*plī'ō-sēn*), or "more recent."	Period of the probable appearance of the Human Races.		
	Miocene (*mī'ō-sēn*), or "less recent."	Gradual formation of man-like types		

Early picture writing of the Chippewa (Ojibwa) Indians.

of the higher cultures it is now placed beyond doubt that all the great divisions of the human family had at that time already been fully developed. Even in the New Stone Age, the present European type had been thoroughly established, as shown by the remains of the "Cro-Magnon Race," so called from the cave of that name in Perigord, France, where the first specimens were discovered. In Egypt, where a well-developed social and political organization may be traced back to the seventh century B. C., Professor Petrie discovered in 1897 the portrait statue of a prince of the fifth dynasty (3700 B. C.) showing regular Caucasic features. Still older is the portrait of the Babylonian King Sargon (3800 B. C.), also with handsome features which might be either Semitic or even Aryan. Thus the Caucasic, that is, the highest human type, had already been not only evolved but spread over a wide area (Europe, Egypt, Mesopotamia) some thousands of years before the New Era. The other chief types (Mongol, Negro, and even Negrito) are also clearly portrayed on early Egyptian monuments, so that all the primary groups had already reached maturity probably before the close of the Old Stone Age.

But these primary groups did not remain stationary in their several original homes; on the contrary they have been subject to great and continual fluctuations throughout historic times. Armed with a general knowledge of letters and other cultural appliances, the higher races soon took a foremost place in the general progress of mankind, and gradually acquired a marked ascendency, not only over the less cultured peoples, but to a great extent over the forces of nature herself. With the development of navigation, and improved methods of locomotion, inland seas, barren wastes, and mountain ranges ceased to present insurmountable obstacles to their movements, which have never been completely arrested, and are still going on.

How the Races Are Classified

On the basis of bodily characteristics, including form, color and features, modern ethnologists have divided mankind into four primary groups, or families: the Caucasian, Mongolian (or Tartar), Negro and American; or, according to color, the *white*, *yellow*, *black* and *red* races. It must not be supposed that these types were sharply marked off from one another; indeed, there must have been a great range of varieties then, as now, due to the conditions under which man lived, as well as to actual race mixtures.

It is probable, however, that all these primary groups had reached definite characteristics before the close of the Stone Age.

The term Caucasian is taken from the mountain-range between the Black and Caspian seas, near which region the finest physical specimens of man have always been found. Mongolian is derived from the wandering races that inhabited the plateaus of central Asia. Negro is the Spanish word for "black." American is applied to the red, or copper-colored, race found in this continent when it was discovered.

The sub-joined table brings into parallel columns the chief distinguishing characteristics of the races:

PHYSICAL AND MENTAL CHARACTERS OF THE PRIMARY HUMAN GROUPS

Points of Contrast	Caucasian, or White	Mongolian, or Yellow	Negro, or Black	American, or Red
Hair	Rather long, straight, wavy and curly, black, all shades of brown, red, flaxen.	Coarse, lank, dull black, round in transverse section.	Short, jet black, wooly, flat in transverse section.	Very long, coarse, black, lank, nearly round in section.
Skin	White, florid, pale, swarthy, brown and even blackish; altogether very variable.	Dirty yellowish and brown (Malays.)	Very dark brown or blackish.	Coppery, yellowish, various shades of brown.
Skull	Two distinct types; long, 74, and short, 80 to 90.	Short; index 84 to 90.	Long; index 72.	Very variable; ranging from 70 to over 90.
Cheekbone	Small, inconspicuous but high in some places.	High prominent laterally.	Small, somewhat retreating.	Moderately prominent.
Nose	Large, straight or arched (hooked, aquiline), narrow.	Very small, snub, but variable.	Flat, small, very broad at base.	Large, arched, rather narrow.
Eyes	Blue, gray, black, brown, moderately large, and always straight.	Small, black, oblique; vertical fold of skin over inner canthus.	Large, round, black, prominent, yellowish cornea.	Small, round, straight, black sunken.
Stature	Variable; 5 ft. 4 in. to 6 ft.	Undersized; 5 ft. 4 in., but very variable.	Above the mean; 5 ft. 10 in.; Negrito often under 4 ft.	Above the mean; 5 ft. 8 in. to over 6 ft., but variable.
Speech	Mainly inflecting; in the Caucasus agglutinating.	Agglutinating, with postfixes; isolating, with tones.	Agglutinating; of various prefix and postfix types.	Polysynthetic almost exclusively.
Temperament	Serious, steadfast, solid and stolid in the north; fiery, impulsive, fickle in the south; active, enterprising, imaginative everywhere; science, art, and letters highly developed.	Sluggish, somewhat sullen with little initiative but great endurance, generally frugal and thrifty; moral standard low; little science; art and letters moderately developed.	Sensuous, indolent, improvident, fitful, passing easily from comedy to tragedy, little sense of dignity, hence easily enslaved; slight mental development after puberty.	Moody, taciturn, wary, impassive in presence of strangers; science and letters slightly, art moderately developed.

GEOGRAPHICAL DISTRIBUTION OF THE RACES OF MANKIND

DISTRIBUTION OF THE CAUCASIAN OR WHITE DIVISION OF MANKIND

ORIGINAL HOME.—North Africa between Sahara and the Mediterranean.

EARLY EXPANSION.—To Europe, the Eurasian Steppes between the Carpathians and the Pamir, Asia Minor, Syria and Palestine, Arabia, Mesopotamia, Iran, or Persia, India, Northeast Asia, Southeast Asia, Malaysia, Polynesia.

LATER EXPANSIONS.—The Caucasian race has now spread, through colonization, over the whole world, but its proper region is Europe, western Asia, and the northern strip of Africa Nine-tenths of the people of Europe belong to the Caucasian family, the other tenth consisting of the Turks, the Magyars (in Hungary), the Finns, the Laplanders, and the tribe called Samoieds in the extreme northeast of European

Russia. In Asia, the Caucasians include the Arabs, the Persians, the Afghans, and the Hindus. In Africa, the Caucasians are spread over the whole north, from the Mediterranean to the south of the Sahara Desert, and to the farthest border of Abyssinia as well as to the greater portion of South Africa. In North and South America three-fourths of the people are now Caucasian. In Australia and New Zealand the Caucasian colonists have almost extinguished the native races.

RELIGION.—The Caucasian race now supports various forms of Christianity in Europe, America, and their Colonies; Buddhism in India; Mohammedanism in Central Asia, Siberia, Turkey, Arabia, North Africa, Irania, India, Malaysia. Originally nature-worship was more pronounced than the cult of ancestor-worship. The Egyptians did not worship but embalmed the dead. The chief gods of the Semites were those of the sun and moon; and those of the Aryans were Dyaus, Indra, Zeus, Jupiter, Apollo, Saturn, etc., all personified elements of the upper regions which later became the basis of extensive systems of mythology. Later these forces were symbolized in wood or stone, which led to idolatry—that is, the worship of the image itself, which still persists among the uneducated in some parts of Christendom. The belief in magic, demons, witchcraft, omens, ghosts and allied superstitions was also very prevalent.

Out of the general polytheism were slowly evolved various shades of monotheism, whence arose the historical religions of the West, such as Judaism, Christianity and Mohammedanism, while crass polytheism persisted in the East—Brahmanism in India, degraded forms of Buddhism in Ceylon and elsewhere. Intermediate between monotheism and polytheism was the Persian religion, which refers light and all good to Ormuzd and his host of angels, night and all evil to Ahriman and his host of demons. Although already denounced by Isaiah, whose Jehovah is the one source of all things, this twofold principle no doubt found its way into the early Christian teachings.

DISTRIBUTION OF THE MONGOLIC OR YELLOW DIVISION

ORIGINAL DOMAIN.—Probably the Tibetan tableland.

EARLY EXPANSION.—Mongolia, Siberia, China, Indo-China, Malaysia, Mesopotamia (?). The earlier Mongolians were extremely migratory, but the more settled tribes developed into the later Japanese, Chinese, Burmese, Siamese, and other peoples in the southeast and east of Asia; and the native tribes of the Siberian plains. The wandering tribes developed into the Turks, Magyars (Hungarians), Finns, Laplanders, and Samoeids, of Europe, and the Esquimaux of America.

RELIGION.—Animism in the widest sense is the dominant note of Mongolian religions. The worship of spirits extended both to the disembodied human soul (ancestor-worship, which is now perhaps the most prevalent form) and to the innumerable spirits, bad and good, which people earth, air, water, the celestial and underground regions. Although nominal Buddhists, the Chinese, Indo-Chinese, and Mongols live in terror of malevolent spirits, and the Annamese scrupulously observe "Roast-pig Day," as they call their All-Souls Day, by littering the graves of the dead with scraps of victuals. Among the Siberians this spirit-cult takes the form of Shamanism, in which the Shaman (wizard or medicine man) is the "paid medium" of communication between his dupes and the invisible good or evil genii. In Tibet demonology still survives beneath the official Lamaism; the Eastern Siberians are Bear-worshipers; and the Polynesians have deified both the living and dead members of their dynasties.

The historical religions are largely a question of race, the Mongols proper, Manchus, Koreans, Japanese, Chinese, Indo-Chinese, and Tibetans being at least nominal Buddhists. The Turks, Tartars, and most Malays are Mohammedans; and the Finns, Lapps, and Magyars now Christians. Other so-called state religions—Confucianism and Taoism in China, Shintoism and Bushidoism in Japan are other ethical codes fostered and upheld for political purposes.

DISTRIBUTION OF THE NEGRO, OR BLACK RACE

ORIGINAL DOMAIN.—The Eastern, or Oceanic, Section had its home in Malaysia, Andamans, Philippines, New Guinea, Melanesia, Australia, Tasmania; with no later expansion. The Western, or African, Section lived in Africa south of the Sahara.

LATER EXPANSION.—Subsequently the Africans spread, either voluntarily or were taken as slaves to Madagascar, north Africa, southern United States, West Indies, and Latin America.

RELIGION.—Spirit-worship very prevalent among native Negro races, and totemism in Australia. The Melanesian system is distinctly animistic, distinguishing between pure spirits, that is, supernatural beings that never were in a human body, and ghosts—that is, men's disembodied spirits revisiting their former abodes. There are prayer, sacrifice, divination, omens, death and burial rites, a Hades too, with trees and houses, as on earth, also a ghostly ruler, but no supreme being. There is little or nothing of all this in Australia or New Guinea, where the religious sentiment is so little developed that many close observers have failed to detect it.

Among African tribes, though religion is animistic, ancestor-worship seems much more prevalent than nature-worship. There is no supreme being anywhere. The chief deities are *Munkulunkulu*, with many variants along the eastern seaboard, and *Nzambi*, also with many variants on the west side, both intermingling in the interior. Witchcraft, omens, and ordeals are very prevalent; pure fetishism and human sacrifices prevail in Upper Guinea, in Uganda and other parts.

DISTRIBUTION OF THE AMERICAN, OR RED DIVISION

ORIGINAL DOMAIN.—The New World. The chief sub-divisions were as follows:

(1) NORTH AMERICAN: *Eskimo, Athabascan* (Chippewaian, Taculli, Hupa, Apache, Navajo); *Algonquian* (Cree, Chippewa, Mohican, Delaware, Shawnee, Cheyenne, Illinois, etc.); *Iroquoian* (Erie, Huron, Mohawk, Tuscarora, Cherokee, etc.); *Siouan* (Dakota, Assinaboin, Missouri, Iowa, Winnebago, Mandan, Tutelo, Catawba); *Muskhogean* (Seminole, Choktaw, Creek, Chickasaw, Alibamu, Apalachi); *Salish; Shoshone; Pawnee; Pueblo* (Zuñi, Hopi, Tegua).

(2) CENTRAL AMERICAN: *Opata-Pima* (Yuma, Cora, Tarahumara, Tepeguana); *Nahuan* (Aztec, Huichol, Pipil, Niquiran); *Maya-Quiché* (Huaxtec, Maya, Lacandon, Quiché, Pocoman, Zendal, Chol, Zotzil, Cachiquel, Mamé); *Zapotec; Mixtec* (Mixé); *Lencan* (Chontal, Wulwa, Rama, Guatusa); *Bribri; Cuna.*

(3) SOUTH AMERICAN: *Chibcha; Choco; Quichua* (Inca, Chanca); *Aymara* (Colla, Calchaqui); *Antisuyu; Jivaro; Zaparo; Pano; Ticuna; Chuncho; Carib* (Macusi, Akawai, Bakairi, Arecuna); *Arawak;* (Atorai, Wapisiana, Naypure, Parexi); *Warrau; Chiquito; Bororo; Botocudo; Tupi-Guarani* (Chiriguana, Caribuna, Goajira, Omogua, Mun-

drucu); *Payagua; Mataco; Toba; Araucan; Puelche, Tehuelche* (Patagonian); *Fuegian* (Ona, Yahgan, Alakaluf.)

PRESENT RESTRICTED DOMAIN.—The Arctic seaboard, Greenland, Alaska; numerous reservations and some unsettled parts of the United States and Canada; most tribes of Mexico, Central and South America are partly intermingled with the whites and blacks and still partly in the tribal state. By far the greater part of the native tribes never progressed beyond the savage state, except in the United States and Canada, where during the past quarter century, and particularly during the last decade, the Indians have rapidly advanced in civilization.

RELIGION.—Shaminism was widely diffused among the North America aborigines. But still more prevalent is the cult of the aërial gods, who support the four quarters of the heavens, and of animals (bear, wolf, raven, jaguar) which has given rise to strange wehrwolf superstitions, and to totemistic systems similar to those of the Australian natives.

Solar worship prevailed in Peru, while the cultured peoples of Mexico (Aztecs, Mayas, Zapotecs and others) had developed a complete pantheon of ferocious deities, such as *Tezcatlipoca, Quetzalcoatl,* and *Tlaloc,* whose thirst for human blood was insatiable. Thus arose an established order of priests, who sacrificed human victims on solemn occasions, and presided over other sanguinary rites often accompanied by unutterable horrors. Aztec women cast their infants into the Mexican lagoons to propitiate the Rain-god *Tlaloc.*

Some modern races, like the Zuñis, have an elaborate and highly mystical ritual, to the exhibitions of which none but the initiated are admissible. The snake-dance of the Moquis of Arizona is a most curious ceremonial and attracts many visitors. The ritual of the Roman Catholic Church has strong attractions for the Indian; and the less elaborate service of the Episcopalians has in several instances helped to win over to Christianity tribes which had long rejected the teachings of missionaries of other denominations.

THE CAUCASIAN THE REAL HISTORIC RACE

Of all these races the only one whose history is important for us is the Caucasian or white race, to which we ourselves belong. This race is "historical" because it displays the most highly civilized type of mankind,—that type whose progress and achievements are the true province of history.

THREE DIVISIONS OF THE CAUCASIAN RACE

This grand stock—the Caucasian race—has been classified into three main branches,—(1) the Aryan or Indo-European; (2) the Semitic; (3) the Hamitic.

The Hamitic branch is named from Ham, the son of Noah, and ancestor of some of its peoples, most notable of which was the ancient empire in Egypt. Accounts of their conquests, under great dynasties of kings, have come down to us in hieroglyphic inscriptions. The Egyptians became highly civilized at a very early time, and exerted a marked influence on the civilization of succeeding ages.

The Semitic branch is so called from Shem, also a son of Noah, described in the Bible as ancestor of some of the nations which it includes. Its chief historical representatives are the Hebrews, Phœnicians, Assyrians, Arabs, and Babylonians. The early Semitic race conquered Chaldea, united Sumer and Accad, and have similarly left us records of their early civilization in cuneiform inscriptions and tablets. It is distinguished in religious history, because from it originated the three faiths whose main doctrine is that there is but one God; namely, the Jewish, the Christian, and the Mohammedan. Apart from this, and with the special exception of the ancient Phœnicians and Carthaginians, the Semitic nations have not been generally distinguished for progress and enterprise, but have mainly kept to their old home between the Mediterranean, the river Tigris, and the Red Sea.

THE SUPREMACY OF THE ARYANS IN HISTORY

The leading part in the history of the world has been, and is still, played by the Aryan nations. The Caucasian presents us with the highest type among the five families of man; the Aryan branch of the Caucasian family presents us with the noblest pattern of that highest type.

The Aryan branch includes nearly all the present and past nations of Europe, the Greeks, Latins, Teutons or Germans, Celts and Slavonians; as well as three Asiatic peoples,—the Hindus, the Persians, and the Afghans and the modern Americans. It is the Aryans that have been the parents of new nations, and that have reached the highest point of intellectual development, as shown in their political freedom, and in their science, literature, and art.

The term Aryan is derived either from one ancient word implying that they were "cultivators of the soil," or from another meaning "worthy, noble." There was a time when these ancestors of the Celts, the Germans, the Slavonians, the Greeks and Italians, the Persians, the Hindus, and of nearly all the European nations, were living together, separate from the ancestors of the Semitic race. Their earliest known home was the high tableland of central Asia, north and northwest of the Himalaya Mountains, near the sources of the Oxus and Jaxartes rivers.

Through pressure of numbers, and spurred on by their own enterprising nature, these Aryan peoples for ages moved mainly westward, from their ancestral seats. A branch went southward across the Himalayas, and peopled Hindustan, Persia, and the intervening lands; another branch at different times and long intervals moved westward into Europe.

The Celts were the first European emigrants and spread themselves over a great part of the continent; as a distinct people they are now only found in parts of the British Isles and France. Later came the Italic (*Latin*) tribes who possessed the peninsula now known as Italy; the Hellenic (or *Grecian*) tribes, who occupied the peninsula of Greece; the Teutonic tribes, who replaced the Celts in central Europe, and finally also occupied Denmark and the Scandinavian peninsula (Sweden and Norway). The last of the Aryans were the Slavonians,

now spread over Russia, Poland, and Bohemia, and the Lithuanians, settled on the Baltic coast, partly in Prussia, partly in Russia. Thus was Europe gradually overspread by successive waves of Aryan settlement.

ARYAN CIVILIZATION BEFORE THE MIGRATION

The study of the early Aryan languages tells us what progress had been made by this race, before the time arrived for starting south and west, to possess the Western world. Whatever words are alike in these Aryan tongues must be the names of implements, or institutions, or ideas, used or conceived before the first wave of migration made its way. We thus learn that, at that far distant time, the Aryans had houses, plowed the earth, and ground their corn in mills. The family life was settled—basis as it is of all society and law—and had risen far above the savage state. The Aryans had sheep, cattle, horses, dogs, goats, and bees; drank a beverage made of honey; could work in copper, silver, gold; fought with the sword and bow; and had the beginnings of kingly rule which subsequently became the central element of the state.

DICTIONARY OF THE HISTORICAL RACE GROUPS

Albanian (*al-bā'ni-an*).—The native and aboriginal race or people of Albania, unlike most of the so-called European "races," is a distinct race physically and not merely in language. It resembles most the Celtic race, but the type is taller: the northern Albanians, like the Montenegrins, rival the Scotch and the Norwegians in stature.

The Albanians are today a mixed race, as is every European people. They are brave, but turbulent in spirit—warriors rathers than workers. Even their own tribes are at enmity among themselves and tribal and family feuds are common. It is the most backward in cultivation of all; and therefore not surprising that the rate of illiteracy is one of the highest in Europe.

In religion the Albanians are about equally divided among the Mohammedan, the Catholic, and the Greek faiths.

The Albanians go under many different names. Skipetar and Arnaut are equivalents of Albanian. All mean "highlander." Until about the fifteenth century they were called Illyrians, or Macedonians. From them came the name of the ancient Roman province of Illyricum, embracing Epirus and parts of Macedonia. All the Slavs of the Balkan Peninsula made their settlements during the middle ages. The Albanians, or Illyrians proper, previously occupied the entire country north to the Danube.

Arabian (*a-rā'bi-ăn*).—One of the three great groups of the Semitic branch of the Caucasian race. The Arabians are related to the Hebrews and include Arabs proper and the wandering Bedouin tribes of the desert. They have long since spread out from the country that bears their name and settled in distant portions of Africa and Asia, as well as penetrated into Europe. They have given their language, through the Koran, to the vaster populations of Mohammedan faith. They are not to be confounded with the Turks who are Mongolian, Tartar, in origin and speech, rather than Caucasian. Neither are they closely related to the Syrians who are Christians and Aryans, not Semites; nor even to the Berbers and the modern Moors of north Africa, who are Hamitic rather than Semitic in origin. Yet Syrians and Moors alike have long used the Arabic tongue.

Armenian (*ăr-mē'ni-an*) or **Haik.**—The Aryan race, or people of Armenia, in Asiatic Turkey. In language they are more European than are the Magyars the Finns, or the Basques of Europe. The nearest relatives of the Armenic tongue are the Persian, the Hindu, and the Gypsy. In religion the Armenians differ from all the above-named peoples excepting the Syrians in that they are Christian. They boast a church as old as that of Rome.

Only a fraction of the Armenians are found in their own country, Armenia; perhaps one-eighth. Over 1,000,000 live in Russia; 400,000 in European Turkey; 100,000 in Persia; about 15,000 in or near Hungary; and 6000 in India and Africa. About half their number still live in different parts of the Turkish dominions. Large numbers have migrated because of the persecutions of the Turks and Kurds directed against them.

Assyrians (*a-sir'i-äns*).—The Assyrian is an ancient language extinct for at least two thousand years. No people today can claim pure physical descent from this stock. The arid region occupied by the early Assyrian empire has been swept by one civilization after another. Their ancient Hamitic speech was largely replaced by that of conquering Medes and Persians and, later, of Mohammedan hosts. It finally disappeared after the Babylonians and Chaldeans, who used a Semitic tongue replaced the Assyrians in Mesopotamia. Turkish, Persian, Kurdish, and Arabian blood has been added to the ancestral stock of the modern Assyrians. Reclus says: "The Assyrians and Chaldeans were either exterminated or else absorbed in the victorious races, forfeiting name, speech, and the very consciousness of their race."

Babylonians (*bab-i-lō'ni-äns*).—Babylonia has always been a land of mixed races and tongues. The earliest of the inscriptions has revealed that the first population was a people belonging to the Mongolian family. The linguistic connection was afterwards confirmed by the discovery by de Sarzec of statues of these primitive inhabitants which present an undoubted Tartar type of features. The skull is that of the Mongolian race with high cheek-bones, curly black hair, the eyes oblique and bright; the type being ethnically related to the Elamites of Susiana and the first Medean stock to which we find this early race linguistically related.

These people were not aborginial to the plains of Chaldea, but came, as their traditions indicate, from the mountains to the northeast, and brought with them the already fairly advanced elements of civilization which they planted in Chaldea. At a very early period in the history of Babylonia the Semites appear as an element in the population, their type being clearly indicated in the sculptures connecting them with the Hebrew and northern Arabs, while the same relationship is linguistically established. From time to time, by war or commerce, other elements were introduced into the population, until almost every nation finds its representative in the "mixed crowd of nations" inhabiting the plains of Chaldea.

The Semites, having once obtained a footing in Babylonia, soon assimilated themselves to the more advanced culture of their Sumero-Accadian masters. They borrowed the cuneiform mode of writing, the religion, mythology, and much of the science of that inventive people, and so rapidly increased in numbers and power, that as early as about 3800 B. C. we find a dynasty of Semitic kings under Sargon of Accad and his son Naram-Sin, ruling in northern Babylonia.

THE WANDERING ARAB LOVES THE DESERT SANDS

Warlike by nature, here we see him scouting the silent wastes with his ever faithful companion in peace or war—restless as the shifting sands.

The desert oasis is his place of assembly for recreation or trade. In the above picture we have a view of a desert market held far remote from any city but at the junction of several caravan routes.

Basques (*báskz*).—A race inhabiting the Basque provinces and other parts of Spain in the neighborhood of the Pyrenees, and part of the adjacent territory in France. They were formerly Iberian as to language, the sole non-Aryan language of western Europe. But few now live in the old province of southwestern France, Gascony, formerly called "Vasconia," after them; about 500,000 still remain in northwestern Spain. They are a fragment, perhaps the only distinct remnant, of the pre-Aryan race of Europe. Recent researches connect them, not with the Mongolian Finns as formerly, but with the Hamitic (Caucasian) Berbers of northern Africa. They are not now easily distinguished in physical appearance from their Spanish or French neighbors, although many still speak the strange Basque tongue. The latter is not inflected, like most European (Aryan) languages, but agglutinative, like the typical languages of northern Asia.

Berbers (*bér'bérz*).—A race of people constituting, with the Cushites, the Hamitic family, which is found scattered over North Africa and the Sahara, from the Red Sea to the Atlantic. The complexion of the Berbers varies from white to dark brown; their features remind one of the Egyptian type; their stature is medium. They have occupied their present habitat since the dawn of history. Never have their indomitable tribes become entirely subject to a foreign master, or lost their racial and linguistic characteristics, in spite of Punic, Roman, Germanic, Arabic, and Saracen conquests. In the mountains they are agricultural; in the Sahara, nomadic. For centuries they have been the middlemen between the Mediterranean coast and the Negro states of the Sudan. In religion the Berbers are nominally Mohammedan. A few tribes have adopted the Arabic, and so have a few Arabs adopted Berber dialects. The Berber languages are often called Libyan. They number at least 7,000,000 in Morocco and Algeria and 500,000 in Tunis and Tripoli.

Bulgarians (*bul-gā'ri-anz*).—The people of Bulgaria are supposed to be Finnic (Mongolian) in origin, are also the most numerous people in European Turkey. The Bulgarians and their neighbors on the north, the Roumanians, are among the rare races that are physically of one stock and linguistically of another. Both possess adopted languages. While the Bulgarians appear to be Asiatics by origin who have adopted a Slavic speech, the Roumanians are Slavs who have adopted a Latin language. While the Bulgarians adopted the language of the Slavs, whom they conquered and organized politically, they were themselves swallowed up in the Slavic population. They lost not only their ancient language but their physical type. While they are the most truly Asiatic in origin of all the Slavs, they are Europeanized in appearance and character. In some respects their life is more civilized and settled than that of some of the Slavs farther west, as in Montenegro and Dalmatia. They are not only less warriors in spirit than these, but are more settled as agriculturists. Yet they seem to feel that they do not belong to the civilization of Europe, properly speaking, for they say of one who visits the countries farther west that he "goes to Europe."

There would appear to be little doubt that the Bulgars came through southern Russia to their present home in the time of the early migrations of the middle ages. Some records locate them in the second century on the river Volga, from which they appear to have taken their name. In fact, a country called "Greater Bulgaria" was known there as late as the tenth century. If the common supposition be correct, the Bulgarians are most nearly related in origin to the Magyars of Hungary and the Finns of northern Russia. After these they are nearest of kin to the Turks, who have long lived among them as rulers. But Turks and Finns alike are but branches of the great Ural-Altaic family, which had its origin in northern Asia, probably in Mongolia.

Carthaginians.—See Phœnicians.

Celts, or **Kelts** (*kelts*).—The peoples which speak languages akin to those of Wales, Ireland, the Highlands of Scotland, and Britanny, and constitute a branch or principal division of the Indo-

This group of present day Bulgarian college girls shows that a striking transformation has been wrought by European influences upon a people of Mongolian origin centuries ago.

European families. Formerly these peoples occupied, partly or wholly, France, Spain, northern Italy, the western parts of Germany, and the British Islands. Of the remaining Celtic languages and peoples there are two chief divisions, viz., the GAELIC, comprising the Highlanders of Scotland, the Irish, and the Manx, and the CYMRIC, comprising the Welsh and Bretons.

Irish, because of its more extensive literature and greater antiquity, is considered to be the chief branch of the Gaelic group. Modern Erse or Scotch is thought to be a more recent dialect of Irish. Manx is the dialect spoken by a small number of persons in the Isle of Man. Welsh is the best preserved of the Cymric group. It has a literature nearly if not quite as rich as that of Irish, and is spoken by a larger population than any other Celtic language found in the British Isles. Low Breton, or Armorican, is the speech found in Lower Brittany, in France. It is spoken by nearly two-thirds as many persons as are all other Celtic dialects combined.

This "Celtic" race seems to have had its main center of dissemination in the highlands of the Alps of midwestern Europe. While all Celtic-speaking peoples are mixed races, those of the British Isles are distinctly long-headed and tall, in fact, are among the tallest of all Europe. It is almost impossible to give the population of the Celtic race—that is, of those whose ancestral language was Celtic—since most of its members now speak English or French only.

Chaldean.—See Babylonian.

Chinese (*chī-nēs′ or-nēz′*).—The race or people inhabiting China proper. Linguistically, one of the Sinitic groups of the Mongolian or Asiatic race. The name Chinese is also applied, erroneously from an ethnical standpoint, to all the natives of the Chinese Empire, including China proper; that is, to the entire Sibiric group. These are, on the northeast the Manchus, on the north the Mongols, on the west the tribes of Turkestan and of Thibet. The name does not properly apply to the other Sinitic peoples—the Cochin-Chinese and the Annamese of the French colonies and the Burmese of the British colonies, all of whom border on China on the south and southwest. The people of Manchuria and of Mongolia are not so nearly related linguistically to the Chinese as they are to the Japanese. All these "Sibiric" peoples have agglutinative languages, while the Chinese is monosyllabic, being more nearly related to the languages stretching from Thibet southeast to the Malay Peninsula.

The Chinese physical type is well known—yellowish in color, with slating eyes, high cheek bones, black hair, and a flat face. The eye is more properly described as having the "Mongolic fold" at the inner angle. This mark is found to some extent in all Mongolian peoples, in the Japanese, and now and then in individuals of the European branches of this race in Russia and Austria-Hungary.

Egyptian (*ē-jipt′ē-ăn*).—The ancient race or people of Egypt, best represented to-day by the Copts or Fellahs, although those are generally of mixed stock. In a political sense, any native of Egypt.

The origin of the Egyptians is still a matter of dispute. It is quite probable that they were Hamitic and belonged to the Berber type. They have no real negroid trace about them, though probably there is a strain from intermarrying; thus it is likely that they may have been a fair-skinned indigenous race, mixed also with people of Asiatic origin, and a certain amount of negro blood. The earliest types, as pictured by themselves on monuments, show men of fine build with no trace of the negroid type; the males are painted red-brown and the females a light yellowish tint.

The fellah (Arabic for ploughman) forms the bulk of the peasantry. They are chiefly Mohammedan in faith, though the Copts, also natives of Egypt, have kept their Christian belief.

The fellah is a hard-working and industrious person, of big build, with a fine, oval face, smooth black hair (the head is usually shaved), and well formed features. The women are often of great beauty, both in form and figure, though they lose their youth early. The Copts are racially the purest descendants of the ancient Egyptians. The coloring of the fellah varies from a fair

The Egyptian features are as unchangeable as the pyramids themselves. On the right is the sculptured likeness of Queen Tiy of four thousand years ago; on the left of an Egyptian girl of the present day.

yellowish shade in Lower Egypt to a deeper tone in Middle Egypt, and in Upper Egypt the majority are a deep bronze. The Arab portion of the population are of two classes: the Arabic speaking tribes who come from the deserts, and the Hamitic tribes who speak a language of their own. The Nubians are chiefly mixed with Arab blood. The foreigners are mainly Greeks, Turks, Italians, British, French, Syrians, Levantines, and Persians.

Etrurians (*ē-tru'ri-anz*), or **Etruscans** (*ē-trus'-kanz*).—The ancient inhabitants of Etruria, the modern Tuscany. The Etrurians are the most mysterious people of antiquity. According to ancient tradition, they came from Lydia in prehistoric times, and colonized Latium. Certain details of their costumes and customs appear to be identical with those of Lydia, and the legend is probably based upon fact.

The Etruscans were proverbially a religious people. Their tombs bear witness to a belief in a future life, and a dread of the malignant power of their deities.

Greeks.—The ancient Greeks belonged to Aryan or Indo-European race. They entered Greece from the North, and as they moved south in separate tribes, the foremost tribes were impelled forward by the pressure of those behind. Even when the whole of the peninsula had been for some time filled and fully occupied, a fresh wave of immigrants swept over the whole country, disturbing everything. Such a wave was the "Return of the Heraclidæ," or the Dorian Invasion. The result was to drive emigrants on to and over the isles of Greece, and to plant Greek cities and Greek culture on the coasts of Asia Minor. At later times Sicily, the Black Sea. Libya, etc., were dotted with Greek colonies, the ancient Greeks were pre-eminent in philosophy and science, leaders in the civilization of their own day, and laid the foundations of modern civilization.

The modern Greek race or people is that which has descended, with considerable foreign admixture, from the ancient Greeks. While the stock has changed much, physically and otherwise, the modern language is more nearly like the ancient Greek than Italian, for instance, is like the ancient Latin.

The Greek race of today is intensely proud of its language and its history, and naturally wishes to be considered as genuinely Hellenic. The official title of the country is now the "Kingdom of Hellas," and any citizen, however mixed in race, styles himself a Hellene. The people are wide-awake on political questions, are avid readers of newspapers, and, like the Greek of older times, eager to learn some new thing. Generally speaking, in customs, superstitions, and folklore, the modern race is a continuation of the ancient.

It may not be commonly known that the greater part of the Greeks live outside of Greece, probably twice as numerous as those in Greece. Ripley says that they form a third of the total population of the Balkan States. On the other hand, von Hellwald says that of the population of Greece itself only about 1,300,000 are truly Greek in race.

Gypsies (*jip'sēz*).—A peculiar wandering race which appeared in eastern Europe in the fourteenth century and is now found in every country of Europe, as well as in parts of Asia, Africa, and America. The Gypsies are distinguishable from the peoples among whom they rove by their bodily appearance and by their language. Their forms are generally light, lithe, and agile; skin of a tawny color; eyes large, black and brilliant; hair long, coal black, and often ringleted; mouth well shaped; and teeth very white. Ethnologists generally concur in regarding the Gypsies as descendants of some obscure Hindu tribe. They pursue various nomadic occupations, being tinkers, basket-makers, fortune-tellers, dealers in horses, etc.; are often expert musicians; and are credited with thievish propensities. They appear to be destitute of any system of religion, but traces of various forms of paganism are found in their language and customs.

The Gypsy calls himself "Rom," whence comes Romany as a name for the language. Special names are applied to Gypsies in the different countries where they are found. Some of these relate to the supposed origin of this singular people, as Gypsy or Egyptian in the British Isles, Bohémien in France, Gitano (Egyptian) in Spain, and Tatare in Scandinavia. In some countries they are known, by a term of contempt, as Heiden (heathen) in Holland, Harami (robbers) in Egypt, and Tinklers in Scotland, but in most parts of Europe a local form of the word Zingani is used to designate them, as Zigeuner in Germany, Cygany in Hungary, and Zingari in Spain.

Intermarriage with other peoples is becoming more frequent. Through loss of language, the assumption of a sedentary life, and intermarriage, Gypsies are decreasing in numbers and seem everywhere doomed to extinction by absorption.

Of the total population of Gypsies in the world, three-fourths are in Europe. There are 200,000 in Roumania, 100,000 each in Hungary and the Balkan Peninsula, 50,000 each in Spain, Russia and Servia, and 50,000 in Germany and Italy combined. The number in the British Isles is variously estimated at from 5,000 to 20,000. There are thought to be 100,000 in Asia and 25,000 in Africa. Only a few thousand are found in the Americas.

Hebrews (*hē'bruz*), **Jewish** or **Israelite.**—The race or people that originally spoke the Hebrew language. They were primarily of Semitic origin, and according to tradition, descended from Heber, the great-grandson of Shem, in the line of Abraham, Isaac, and Jacob. They are scattered throughout Europe, especially in Russia, yet preserve their own individuality to a marked degree. Linguistically, the nearest relatives of the ancient Hebrew are the Syriac, Assyrian, and Arabic languages. While the Hebrew is not so nearly a dead language as the related Syrian, Aramaic, or the ancient Assyrian, its use in most Jewish communities is confined mainly to religious exercises. The Jews have adopted the languages of the peoples with whom they have long been associated. More speak Yiddish, called in Europe "Judeo-German," than any other language, since the largest modern population of Jews borders on eastern Germany and has been longest under German influence.

Physically the Hebrew is a mixed race. In every country, however, they are found to approach in type the people among whom they have long resided. The two chief divisions of the Jewish people are the northern type, and the Spanish or southern type. The latter are now found mainly in the countries southeast of Austria. They consider themselves to be of purer race than the northern Jews and in some countries refuse to intermarry or worship with the latter. Their features are more truly Semitic.

The social solidarity of the Jews is chiefly a product of religion and tradition. Taking all factors into account, and especially their type of civilization, the Jews of today are more truly European than Asiatic or Semitic.

The Jews are endowed with the most varied qualities, as shown by the whole course of their checkered history. Originally pure nomads, the Israelites became excellent husbandmen after the settlement in Canaan, and since then they have given proof of the highest capacity for poetry, letters, erudition of all kinds, philosophy, finance, music, and diplomacy. The reputation of the

This remarkable Cliff Palace of Chapin's Mesa, Colorado, is believed to have been constructed either by the Pueblo Indians or their immediate predecessors. Originally it was a city in itself, being prepared for siege, drought, and famine, besides the necessities of every-day life.

medieval Arabs as restorers of learning is largely due to their wise tolerance of the enlightened Jewish communities in their midst.

In late years the persecutions, especially in Russia and Roumania, have caused a fresh exodus, and flourishing agricultural settlements have been founded in Argentina and Palestine.

Jewish immigrants usually, however, settle in the cities. New York City, for example, has the largest Jewish population of any city in the world, now estimated by some at about 1,000,000, or nearly one-fourth of the total population. About 50,000 more are added annually. Among large cities, Warsaw and Odessa have a still larger ratio of Jewish population, namely, one-third. In London, on the contrary, only one-fiftieth of the population is Hebrew. The Jewish population of the entire United States is less than 2,000,000.

Hindus (*hin'duz*), or **Hindoos.**—The native race in India descended from the Aryan conquerors. Their purest representatives belong to the two great historic castes of Brahmans and Rajputs. Many of the non-Aryan inhabitants of India have been largely Hinduized. More loosely the name includes also the non-Aryan inhabitants of India.

It is not generally realized how great a number of races and tribes there are in India, many of them extremely low in civilization and approaching the Negro in physical characteristics. Such are some of the Dravidas and Mundas, who occupy all of southern India. In greatest contrast with these are the Aryan Hindus of the north, more closely related in language, if not in physical appearance, to the northern Europeans than are the Turks, Magyars, and various peoples of eastern Russia.

Hindi and Hindustani are the most widely spread modern languages or group of dialects of India. Hindustani is generally understood to be the polite speech of all India, and especially of Hindustan. Hindi, in the wider sense of the term, is spoken by 97,000,000 of people, mainly of northern India. The darker non-Aryans and Mongolians alone of India nearly equal the population of the United States. There are one hundred and forty-seven peoples or tribes speaking different languages.

Indians (*in'di-anz*).—The aboriginal inhabitants of North America were so named on the supposition that the lands discovered by the early navigators were parts of India. This erroneous name has continued in use ever since, notwithstanding attempts at its correction. The Indians were not nomadic until after the arrival of Europeans, who drove many tribes from their established seats to those occupied by other tribes. From the same Europeans they procured the horse and firearms, both of which were necessary to a nomadic life under the existing conditions.

Explorers and early settlers gave fanciful names to many of the groups of Indians which they encountered. Efforts to reproduce native tribal names (unpronounceable in foreign tongues) in the traveler's own language, resulted in many different names for the same tribes. Several thousand names for Indian tribes or groups are found in the English and European writings of the last three hundred years.

Recent ethnological study tends to recognize possibly two marked types of North American Indians, (1) those facing the Pacific and the Asiatic Continent with its broad-headed Mongolic races; and (2) those found chiefly on the Eastern Slope, looking toward Africa and Europe. They incline to the view, also, that the race is not traceable to a "*single* origin, but that immigrants came by many routes from many regions." While a similarity in the new environment tended to bring the fragments of the old populations into similarity of physical type, likenesses in language, are accepted as the sound basis for classification of Indian tribes and groups.

Major J. W. Powell, in 1891, recognized "fifty-eight linguistic families," and mapped the geographic distribution of these great stocks over the continent. The Pacific coast has a multiplicity of small linguistic families; while the more populous central and eastern parts have comparatively fewer linguistic stocks. Dr. McGee, in 1896 estimated the number of Indian tribes belonging to various linguistic families at 782—the largest number of these, tribes of little importance, numerically or historically. Some of the principal linguistic families are:

1. The Algonquian (including thirty-six tribes) originally distributed along the Atlantic Coast from Newfoundland and Nova Scotia as far south as North Carolina, and throughout the middle portion of the continent from Tennessee, northward throughout the main part of Canada. Among them were the tribes found in New England and Virginia by the earliest settlers from Europe,—the Abnaki, Delawares, Narragansetts, Pequots, Powhatans, Mohegans, Ottawas, Illinois, Objibwa (Chippewa), Cheyennes, Siksika and Arapaoes, with the now largely civilized and dispersed Potawatomi.

2. The Athabascan (fifty-three tribes) chiefly found now in Northwestern Canada, but including also the large Southwestern tribe of (about 30,000 Navahoes, in Arizona and New Mexico; the Apaches and the Mescaleros, with a few small tribal groups on the coast of central and northern California.

3. The Iroquoian (thirteen tribes) among which were the famous "Five Nations" of New York, including the Cayugas, Oneidas, Senecas,

TWO INSTRUCTIVE VIEWS OF THE AMERICAN INDIAN

The former free and open life of the plains is now supplemented with the refinements and even luxuries of modern American life. Rich in lands, and protected by the guardianship of the American government, the future of the Indian is unusually safe-guarded.

The Indian farmer is under the instruction of upward of five hundred skilled specialists who demonstrate the art of profitable farming. His lands equal in area all New England and New York, and their value is placed at six hundred million dollars.

Onondagas, Tuscaroras, Mohawks, the numerous Cherokees, and the Hurons, nearly annihilated in 1650 by the Iroquois.

4. THE SIOUAN (sixty-eight tribes) including the great Dakota (Sioux) tribes, with their numerous sub-divisions; the Omahas, Poncas, Osages, the Winnebagos, Iowas, Crows; and the Catawbas in Carolina, who perhaps mark the original eastern habitat from which Siouan tribes moved northwest.

5. THE SHOSHONEAN (twelve tribes) including the Comanches, Utes, Hopis, and Shoshone.

6. THE MUSKHOGEAN (nine tribes) including the Creeks, Choctaws, Chickasaws, and Seminoles.

7. THE ESKIMAUAN family (seventy tribes) scattered through Greenland and the Arctic Coast and islands of Central and North America and Alaska.

8. THE PUEBLO, including the Zuñi, Hopi and Tegna.

On the continent of North America, north of Mexico, three or four hundred years ago, there were probably about 1,150,000 Indians. Of these, perhaps 850,000 were on territory now that of the United States proper; 220,000 in British America; 72,000 in Alaska; and 10,000 in Greenland. Numerous and prolonged intertribal wars, ravages of tuberculosis, and fevers, are known to have swept off entire populations of large districts, before contact with Whites had greatly accelerated the death-rate of the American Indians. Smallpox, introduced by the Whites, has nearly extinguished entire tribes, time after time. Whiskey, and attendant dissipation, sexual diseases brought in by Whites, and the lowered vitality which results from changed conditions of life, with tuberculosis, rendered much more deadly in the conditions of life forced upon Indians by the Whites, had largely reduced the Indian population before 1800, and have steadily tended toward the extermination of Indians since that date, although intermarriages and enrolment of mixed-bloods have kept up the numbers on tribal rolls.

The most interesting groups of Indians in Central and South America have been the (a) Aztecs, (b) Pipils, making the *Nahuatlan* group; and the (a) Mayas, (b) Quichés, (c) Pocomans, making the *Huastecan* group.

THE AZTECS were the dominent race in Mexico prior to their conquest by Spaniards. Although the name is usually extended to all the semi-civilized tribes of Nahuatlan (*Aztlan*, "heron clan") stock, it properly belongs only to a small group of seven related clans. The principal tribe had its capital at Tenochtitlan, now the city of Mexico. They developed a form of astronomy which was mainly astrological, and could take accurate observations, not only of lunations, but also of the periods of Venus. They divided the solar year into eighteen months of twenty days each and named each day by consecutive hieroglyphics. Their writing system was mainly pictorial. The Aztec monuments, however, or pyramids surmounted by temples, were not to be compared with those of Yucatan, while the finest in Mexico itself (Teotihuacan, Colula, Papantla) were the work of their Toltec predecessors.

Possessed of a high degree of culture, the Aztecs were also notorious for their cruelty and the barbarous character of their religious rites. Some of their descendants, comparatively pure in blood and retaining the ancient language, are still to be found in the neighborhood of the city of Mexico.

INCAS (*ing'käz*).—The reigning and aristocratic order in ancient Peru from the thirteenth to the sixteenth century. They were originally a tribe or family of the Quichés who inhabited certain valleys near Cuzco and first became dominant under Manco Capac about 1240. Their own traditions described Manco Capac as a child of the Sun. From him descended the twelve other historical sovereigns of Peru, the last reigning one being Huascar. though the lineage was preserved long after. These sovereigns (the Incas in a restricted sense) always married their own sisters, and the throne was inherited, in general, by the oldest son proceeding from this marriage. Children by their other wives could not, by custom or law, receive the crown, though this rule was broken when Atahualpa inherited a part of the empire in 1523. The rule of the Incas was absolute, but very mild. They had attained to a high state of civilization before the arrival of the Spaniards. They cultivated many of the arts, and had some knowledge of astronomy. They had domesticated the llamas and alpacas, had brought under cultivation maize, potatoes and other edible roots, understood mining and the working of metals, and excelled as masons, weavers, potters, and farmers. They brought the science of government to a high pitch of perfection. The Incas composed songs and dramas; and as soldiers their skill and prowess enabled them to conquer and consolidate a vast empire. Three centuries of oppression under Spanish rule have deteriorated the character of the Inca Indian, but he is still industrious and honest, and retains some of the virtues of his ancestors.

Israelites.—See Hebrews.

Japanese.—The Japanese and Koreans form the easternmost group of the great Sibiric branch, which, with the Sinitic branch (Chinese, etc.,) constitutes the Mongolian race. The Japanese and Koreans stand much nearer than the Chinese to the Finns, Lapps, Magyars, and Turks of Europe, who are the westernmost descendants of the Mongolian race. The languages of all these peoples belong to the agglutinative family, while Chinese is monosyllabic.

Although many people may mistake a Japanese face for Chinese, the Mongolian traits are much less pronounced. The skin is much less yellow, the eyes less oblique. The hair, however, is true Mongolian, black and round in section, and the nose is small. These physical differences no doubt indicate that the Japanese are of mixed origin. In the south there is probably a later Malay admixture. In some respects their early culture resembles that of the Philippines of today.

Then there is an undoubted white strain in Japan. The Ainos, the earliest inhabitants of Japan, are one of the most truly Caucasian-like people in appearance in eastern Asia. They have dwindled away to less than 20,000 under the pressure of the Mongolian invasion from the mainland, but they have left their impress upon the Japanese race. The "fine" type of the aristocracy, the Japanese ideal, as distinct from the "coarse" type recognized by students of the Japanese of today, is perhaps due to the Aino.

The race, as a whole, is physically under-developed, the men being small, and harsh in feature, while the women lose their good looks after the first bloom of youth is over. The girls, with their rosy cheeks, fascinating manners, and exquisitely tasteful dress, are, however, particularly attractive, and the children are bright and comely, being allowed full liberty to enjoy themselves—indeed Japan is the paradise of children.

The Japanese have many excellent qualities, they are kindly, courteous, law-abiding, cleanly in their habits, frugal, and possessed of a high sense of personal honor which makes sordidness unknown. This is associated, moreover, with an ardent patriotic spirit, quite removed from factiousness. On the other hand the people are deficient in moral earnestness and courage, which leads to corruption in social life and institutions.

The people of Japan are noted for their love of things beautiful. The above scene is a typical picture of an exquisite garden, presided over by several picturesquely gowned Japanese girls.

The town costume of the Japanese gentleman consists of a loose silk robe extending from the neck to the ankles, but gathered in at the waist, round which is fastened a girdle of brocaded silk. Over this is worn a loose, wide-sleeved jacket, decorated with the wearer's armorial device. White cotton socks, cleft at the great toes, and wooden pattens complete the attire. European costume has been prescribed by government as the official dress, and the empress and her suite have recently adopted foreign costume, being followed to a certain extent by the fashionable ladies of the capital. Hats are not generally worn, except by those who follow European fashions or in the heat of summer.

The women wear a loose robe, overlapping in front and fastened with a broad heavy girdle of silk (*obi*), often of great value. In winter a succession of these robes are worn, one over the other. The formerly universal chignon coiffure of the women, stiff with pomatum, which was done up by the hair-dresser once or twice a week, is rapidly yielding to the simpler Grecian knot.

Mode of Living.—Japanese houses are slight constructions of wood. In the northern districts at least two sides of the house are closed in with walls of mud plastered on wicker-work. The floors are covered with thick soft straw mats, measuring six by three feet, and the accommodation of the houses is reckoned by the number of these mats. On them the inmates sit, eat and sleep, the bed-clothes—heavily padded quilts—being kept during the day in adjoining closets. Rice is the staple food of the people, but in the poorer mountainous regions millet often takes its place. Fish, seaweed, and beans in all forms are served with the rice, especially in the soups, which likewise contain bean curd, eggs, and vegetables. Chestnuts and hazel-nuts are also largely eaten, and the walnut is made into a sweetmeat. *Shōyu* (soy), a sauce made of beans and wheat, is the universal condiment. Fowls are now pretty widely used for the table, and pork and beef, as well as bread, are increasingly eaten.

Manners and Customs.—The social position of women is more favorable than in most non-Christian countries, but still leaves much to be desired. Marriages are arranged through an intermediary, and both sexes marry at an early

age. As the continuance of families is a point of great importance, adoption is largely resorted to in order to prevent families dying out. Great respect is paid to the dead, and posthumous names are conferred after death, some of the most celebrated names in Japanese history being posthumous titles. Heavy sums are lavished on funerals.

Until lately the only vehicles in Japan were two kinds of palanquin; but in all the more level districts these have now been superseded by the *jinrikisha* (man-power-carriage), a sort of two-wheeled perambulator drawn by a man who runs between the shafts. In many of the more mountainous regions the roads are impracticable even for the *jinrikisha*.

The Jinrikisha (*jin-rik'i-shaw*) or two-wheeled carriage generally in use in Japan.

The Japanese are essentially a pleasure-loving people, and spend comparatively large sums upon amusements. The theater, though formerly despised by the *samurai* class, who refused to enter its doors, forms one of the chief national resorts. The time of greatest festivity is the New Year, now held contemporaneously with our own, when pinetrees are planted before the doors, the houses are gay with decoration, and presents are lavishly made. The favorite game at this season is *oyobane*, a kind of battledore and shuttlecock. January is the kite season; the smaller kites are of various fantastic shapes, while the larger and more powerful ones are usually rectangular. Wrestling, juggling, and archery are favorite sports.

Religions of Japan.—There are two prevailing religions in Japan—*Shintoism* (The way of the gods), the indigenous faith; and Buddhism, introduced from China in 552.

The characteristics of Shintoism in its pure form are the absence of an ethical and doctrinal code, of idol-worship, of priestcraft, and of any teachings concerning a future state, and the deification of heroes, emperors, and great men, together with the worship of certain forces and objects in nature.

Of Buddhists there are no fewer than thirty-five sects. The monks have assumed the functions of priests, and Japanese Buddhist worship presents striking resemblances to that of the Roman Catholic Church. Notwithstanding the increased patronage recently bestowed upon Shintoism by the government, Buddhism is still the dominant religion among the people.

Japan is a land of temples, but many are now falling into decay, while others are turned into schoolhouses. Every grove has its shrine and *torii*, a structure in wood or stone, consisting of two upright pillars joined at the top by two transverse beams or slabs; metal torii are also not unknown. The Buddhist monasteries in the Japanese middle ages were undoubtedly wonderful centers of civilization, and the priests for long commanded reverence by their self-denial.

Latins, or **Latini** (*la-ti'ni*), or **Romans.**—The ancient Latins inhabited Latium, on the west coast of central Italy, before the existence of Rome. It would seem that they had branched off from the Aryan stem next after the Celts, and upon entering Italy soon united with the primitive Liguirians, later forming a confederation or league of which Alba Longa became the head.

Out of the Latins, Etruscans (which see) and Sabines (another primal stock), the Roman people were originally formed, each speaking a most marked variety of the original Italic mother-tongue. The principal element was *Latin*, as the language shows. The next in importance was the *Sabine*, and the third, in order both of time and of influence, was the *Etruscan*. But with the spread of the Roman arms (the Romans were Latins), all were absorbed by the Latin variety, which still lives in its modern progeny—Italian, Spanish, Portuguese, Langue d'Oc (South France), Langue d'Oïl (North or Standard French), Roumanian, Walloon of Belgium, Rumansch or Ladin and Vaudois of Switzerland. Thus half of Europe has been Latinized, while the different nationalities still retain their distinctive physical and mental characters.

Malays (*mā-lāz'*).—Blumenbach, the father of ethnology, regarded the Malays as one of the five grand divisions of mankind; but the weight of modern authorities is in favor of considering them as a branch of the Mongolian race. They are distinguished in color by a variety of shades of brown, and are native to the Malay Archipelago and Peninsula and the Island of Madagascar, with perhaps a few related remnants of tribes in Indo-China. The Malay Archipelago includes the Philippines, but not New Guinea on the east. Within this archipelago there is no other native race with the exception of the small groups of pigmy Negroes called Negritos distantly related to the Papuan of New Guinea, if not to the Australian.

All the languages spoken by the Malay race belong to the great Malayo-Polynesian family of languages, which are found everywhere among Polynesians; that is, as far east as the waters of South America and northward to include the Hawaiian Islands. The term Malay is also applied in a narrower sense to that part of the Malay race called the "true Malay" or "*Orang*

Malaya," that is, the section speaking the standard Malay tongue and which lived originally in and about the Malay Peninsula.

While linguistically the Malays are radically distinct from the Mongolians, physically they approach them more nearly than any other great race. The lighter brown color found in some sections approaches the yellow of the Chinese, and the slanting eye or "Mongol fold" of the upper lid is frequently found where no intermixture can be assumed. The appearance of the face and head is also somewhat similar in these races. In temperament and native civilization, however, the Malay is quite distinct. He has primitive, cruel instincts more like those of the American Indian. He has nowhere accepted the Mongolian type of civilization so much as the Caucasian type. The Filipinos are far in advance of any other Malay people in the latter respect, although the earlier Malayan civilization was most highly developed in Java. Buddhism has here been replaced by Mohammedanism, which has extended even into the southern Philippines.

The question of their origin has been much discussed, some fixing the cradle of the race on the Asiatic mainland, others in Sumatra.

The Malay intellect is of a low order, and the race has never developed a native culture, their civilization being entirely due to foreign influences, chiefly Hindu and Arab.

Mongolian (*mon-gō'li-ăn*).—The second in Blumenbach's classification of the races of mankind. The chief characteristics are broad cheekbones, low, retreating forehead, short and broad nose, and yellowish complexion. It included the Chinese, Japanese, Turks, Tartars, Indo-Chinese, Lapps, etc. The Mongolian and the Caucasian are the two largest races, or divisions, of mankind,—the latter being somewhat the larger because it includes the greater part of the population of India.

Finish girl of to day—a descendent of Mongolian ancestors who settled in Europe centuries ago.

Just as the Caucasian race extends into southwestern and southern Asia, so the Mongolian race extends far into Europe, embracing not only the Lapps of Scandinavia, the Finns, Cossacks, and many other peoples of Russia, and the Turks of southern Europe, but even the Magyars of Hungary, the most advanced of all the Europeans of Mongolian origin. The main western branches of the Mongolians, although Europeanized in blood as well as in culture, still possess a Mongolian speech.

Brinton divides the Mongolian race into two great branches, the Sinitic and the Sibiric.

The word "Sinitic" is derived from the late Latin *Sina*. China. It comprises that branch of the Mongolian race of which the Chinese, Indo-Chinese, and Tibetan groups are the chief representatives.

The Sibiric branch of the Mongolian race comprises the Japanese, Arctic, Tungusic, Finnic, Tataric, and Mongolic groups, and therefore all the Mongolian peoples which have invaded Europe, such as the Finns, Lapps, Magyars, and Osmanlis or Turks.

Moor is a term applied to very different peoples of northwestern Africa. In Roman history it is applied to inhabitants of Mauretania (Morocco and Algeria), who were in part Phoenician colonists. In Spanish history the "Moors" and "Moriscos" were mainly Berbers rather than, as commonly supposed, Arabs. Today the word is wrongly applied to the Riffs of Morocco and to the town dwellers of Algeria and Tunis. The latter call themselves generally "Arabs," although often in part of Berber blood. The Moors, in a stricter racial sense, are the mixed Trarza and other tribes on the western coast, from Morocco to the Senegal, mainly of nomadic habits. They are of mixed Berber, Arab, and often Negro blood. Many speak Arabic.

Negro.—The only negroes to whom practically all ethnologists are willing to apply the term are those inhabiting the central and western third of Africa, excluding even the Bantus, who occupy practically all Africa south of the Equator. The Bantus, well typified by the Zulu subdivision, are lighter in color than the true negroes, never sooty black, but of a reddish-brown. From the negroes proper of the Sudan have descended most American negroes.

To some extent the northern Negro stock has become intermixed with the African Caucasian, especially about the Upper Nile, in Abyssinia, and in Gallaland and Somaliland farther east. Keane's theory is that the Australians and Africans represent the earliest offshoots of the precursors of man who inhabited the continent now submerged in the Indian Ocean. In line with this theory is the claim that the Veddahs and Dravidians of India are still more divergent branches toward the north which have become more affected by Caucasian or, perhaps, Mongolian elements.

The Papuans and Nigritos of Australasia, having all or most of the characteristics of the African negroes, are classed with them.

There is a bewildering confusion in the terms used to indicate the different mixtures of white and dark races in America. Thus, all natives of Cuba, whether colored or white, are called "creoles," as this word is loosely used in the United States; but creole, as more strictly defined, applies only to those who are native-born but of pure European descent. This is the use of the word in Mexico. In Brazil and Peru, on the contrary, it is applied to those possessing colored blood in some proportion; in Brazil to Negroes of pure descent; and in Peru to the issue of whites and mestizos. "Mestizo" is the Spanish word applied to half-breeds (white and Indian.)

Slave Traffic in America.—The importation of Negroes into America has been going on steadily since the early years of the sixteenth century, when it was begun by the Spaniards, even the good Las Casas recommending it in the interest of the native Indians. Both Queen Elizabeth and King James I. issued patents to English slave-trading companies operating between the coast of Guinea and the American colonies. Britain, by the Treaty of Utrecht in 1713, engaged to carry out the contract of the old French Guinea Company, and to import into the New World one hundred and thirty thousand slaves in the course of the next thirty years, and is said to have more than made good the engagement.

In the United States the traffic was open and active until the passage of the Act of 1794 prohibiting the importation of slaves into any of the federal ports. Long after this it continued to be

a brisk business in the West Indies and South America. As late as 1840 there were seventy-five ships plying constantly between Brazilian ports and the African coast, bringing cargoes of three or four hundred slaves at each trip. The principal points at which the slaves were obtained were along the coast of Guinea, especially on what was known as the Slave Coast, between the rivers Lagos and Assinie, where were the crowded marts of Waidah and Anamaboe, and again along the Angola coast. In these two regions the traders encountered two quite different branches of the African race, and their human wares in America show that they were derived from different sources. Along the Guinea coast, whence most of the slaves brought to the United States were derived, the population belongs to the true negro type.

In Brazil and other parts of South America the preponderance of importations was from the negroid stock of the equator, whose dialects and physical traits are allied to those of the Kaffirs and Zulus of the east coast (Bantus). The slaves in all parts, however, being from mixed stocks, their descendants do not present any well-marked peculiarities inside those of the race. As a rule, they are in strength equal to the whites, and in endurance of exposure and labor under a tropical sun are superior to all other immigrants.

It is usually held that the negro is not naturally industrious; but this seems to some extent answered by the severe field labor of many tribes, both men and women, in their native continent, and by the official reports of the United States government showing a greater acreage of land under cultivation in the former slave states and a larger crop of cotton than before the Civil War. When under the control of a strong social organization, and with obvious motives for industry and economy before his eyes, the American negro is both industrious and provident, and the instances are numerous where members of the race have accumulated fortunes of respectable size. Their vitality appears on the whole to be about the same as the whites, except in the more northern states, where it is unquestionably much less. In New England and Canada negroes gradually but surely perish.

NEGRO CHARACTERISTICS.—The negro is a tireless talker and story-teller. Many of them reveal a high stage of the art of story-telling, as the Georgia tales collected from the southern states by various writers attest. Many of them belong to the class of "beast-fables," similar to some which have been collected among the American Indians and the natives of the African continent, and such as were favorite staples of amusement in Europe during the middle ages.

One of the principal figures is the rabbit—the "brer rabbit" of the "Uncle Remus" tales. He figures conspicuously not only in the southern United States, but in the West Indies and on the Amazons, and in the folklore of the Venezuelan negroes.

Along with story-telling, singing and music are favorite diversions of the colored population. This tendency is a direct inheritance from their African ancestry, as throughout that continent the natives are passionately fond of these diversions. In Central America the negroes still employ the *marimba*, a native African instrument with wooden keys placed over jars or gourds, the keys being struck with a stick. In the United States the violin, the fife, and the guitar are used, but the favorite is the banjo, an instrument of African derivation, modified from the guitars with grass strings still in use on the Guinea coast. With these simple means they produce music of pleasant though not artistic character. In individual instances (as Blind Tom, born in Georgia in 1849) members of the race have attained remarkable skill on the piano and organ, rendering the most difficult compositions with spirit. No negro composer, however, has attained wide celebrity. Their songs are numerous, many of them of a religious character, others turning on the incidents of daily life. They are generally defective in prosody and without merit, being often little more than words strung together to carry an air.

Persians (*per'shanz*).—The natives or inhabitants of ancient or of modern Persia. The Persian race or people is quite different from the Persian nationality. The latter includes several very different peoples, as will presently be seen. Linguistically the Persian is the chief race of Persia speaking an Iranic language, that is, one of the Aryan tongues most nearly related to the Hindi. Physically, the race is of mixed Caucasian stock. It is almost entirely composed of Tajiks. The small section known as "Parsis" or, incorrectly, "Fire worshipers," have for the most part emigrated to India. The Armenians are so closely related to the Persians as to be put with them by some into the Iranic branch. The Kurds, the Beluchis, and the Afghans also belong to the latter.

Of the 9,500,000 estimated population of Persia about two-thirds are true Persian or "Tajik" The other third is also Caucasian for the most part, including Kurds (400,000), Armenians (150,000), and other Iranians (820,000), and the non-Aryan Arabs (350,000). There are 550,000 Turks and 300,000 Mongols in the Empire. The only Christians are the Armenians and a small group of 25,000 "Chaldeans," "Assyrians," or "Nestorians," really eastern Syrians, about Lake Urmia, on the northwestern border.

In intellect, if not in civilization the Persian is perhaps more nearly a European than is the pure Turk. He is more alert and accessible to innovation. Yet he is rather brilliant and poetical than solid in temperament. Like the Hindu he is more eager to secure the semblance than the substance of modern civilization.

MODERN RUSSIAN POLICE OFFICER

Slavs (*slàvz*).—Peoples widely spread in eastern, southeastern, and central Europe. The Russian and Polish are its leading tongues. The Slavs are divided into two sections—the southeastern and the western. The former section comprises the Russians, Bulgarians, Serbo-Croatians, and Slovenes; the latter, the Poles, Bohemians, Moravians, Slovaks, Wends, etc.

Physically, and perhaps temperamentally, the Slavs approach the Asiatic, or particularly the Tartar, more closely than do the peoples of western Europe. In language they are as truly Aryan as ourselves. Of course, languages do not fuse by interbreeding; physical races do. There is some truth in the old saying, "Scratch a Russian and you find a Tartar," especially if he come from southern Russia, where once lived the Mongol conquerors of the Russians.

RUSSIAN POSTMAN

Yet the common conception of the Slav as dreamy and impractical does not seem to fit with the greatness of the new nation which impresses the imagination of the beholder more than any other in Europe. The fact is that we do not know the Slav. Unfortunately the unlikeness of the language to those of western Europe, perhaps even the unfamiliarity of the alphabet used, has delayed the study of what must soon be regarded as one of the great languages and literatures of civilization. Its spread, like that of the Russian Empire, has been more rapid than that of any other in the present century.

If the Slav be still backward in western ideas, appliances, and form of government, it is nevertheless conceivable that the time is not far distant when he will stand in the lead. The race is still young. Its history is shorter than that of any other important people of Europe.

Turning to the physical characteristics of the Slavs, it is found that there is not, properly speaking, a Slavic race. Deniker says that no fewer than five European races are represented among the Slavs, besides Turkic and Ugric or Mongolian elements. These are the fair, but broad-headed and short races, in Poland and White Russia especially; the dark, very broad-headed, and short peoples among the Little Russians of the south, the Slovaks, and some Great Russians; and the taller, but still dark and broad-headed races among the southwestern Slavs or Serbo-Croatians and some Czechs and Ruthenians. In the northwest the Russians have been modified by the blond or Teutonized Finns, in the northeast by the dark Finns, and in the southeast by the Tartars; but all such alike are broad-headed Mongolians in origin. With the exception of these Asiatic remnants and the related Magyars and Turks, and the Greeks, all of Europe east of Germany is filled with Slavs. They occupy more than one-half of the continent of Europe, and their presence has been a fertile source of political and governmental dissensions for many centuries, particularly in the Balkan countries. Indeed the scourge of war which has been ravaging all Europe, since 1914, is traceable in no small degree to this admixture of racial elements.

Servian Slav woman showing the native costume worn by the Servian women on feast days.

Russian Slavs, in native costumes, from a southern province on the Black Sea.

Teutonic.—This great branch of the Aryan family of languages and "races," includes all those of northwestern Europe excepting the Celtic. The Teutonic was the second Aryan swarm in Western Europe, that which came after the Celts, and is the one with whose history we are more concerned than with that of any other; for it is the branch of the Aryan family to which we ourselves belong. The Teutons were the forefathers of the Germans and the English, and of the Danes, Swedes, and Norwegians in Northern Europe. They do not appear in history till a much later time than the Celts, and then we find them lying immediately to the east of the Celts, chiefly in the land which is now called Germany. From this they spread themselves into many of the countries of Europe; but in most cases they were absorbed into the earlier inhabitants, and learned, like them, to speak the language of the Romans. The chief parts of Europe where Teutonic languages are now spoken are Germany, England and Scandinavia.

In Scandinavia we cannot doubtt hat the present Teutonic inhabitants were the first Aryan settlers; for they found a Mongolian people there, some of whom still remain, by the name of Lapps and Finns, in the extreme north of Sweden and Norway and on the eastern coast of the Baltic. But in most places the Teutons, as the second wave, came into land where other Aryan settlers had been before them. Sometimes they may have simply come in the wake of the Celts as they were pressing westward; but, sometimes they found the Celts in the land and drove them out, as was specially the case in Britain. Of the first coming of the Teutons into Europe we can say nothing from written history, any more than of the first coming of the Celts.

The Teutonic stock of nations, as they exist at the present day, is divided into two principal branches: (1) The Scandinavian, embracing Danes, Swedes, Norwegians, Icelanders; and (2) the Germanic, which includes, besides the German-speaking inhabitants of Germany proper and Switzerland, also the population of the Netherlands (the Dutch), the Flemings of Belgium, and the descendants of the Angles, Saxons and Jutes in Great Britain, together with their offspring in North America, Australia, and other British colonies—the English-speaking peoples of the world. It is necessary in this case, as in all similar cases, to guard against making lan-

THE TEUTONIC RACIAL GROUP

- LOW GERMAN
  - NORSE
    - W. Branch
      - Old Norwegian
        - Icelandic.
        - W. Dalecarlian.
        - Jämetlandish.
        - Faroic.
    - E. Branch
      - Danish
        - Bornholm.
        - Normanno-Jutish.
        - Dano-Jutish.
      - Swedish
        - E. Dalecarlian.
        - Gothic.
        - Scanian.
  - NIEDER-DEUTSCH
    - Frisic
      - W. Fr. Groningen.
      - E. Fr. Saterland.
      - N. Fr. Helgoland, Sylt, etc.
    - Continental Saxon
      - Old Saxon of the "Heliand."
      - Westphalian.
      - Hanoverian.
      - Brunswick.
      - Pomeranian, etc.
    - Anglo-Saxon (English)
      - Anglisc (Northern)
        - Northumbrian.
        - Lowland Scotch.
        - Shetland, etc.
      - Midland
        - Lincoln.
        - Yorkshire.
        - Derby, etc.
      - Saxon (Southern)
        - Cornish.
        - Somerset.
        - Dorset.
        - Kent, etc.
- HIGH GERMAN
  - MITTEL-DEUTSCH
    - Salic Frankish (extinct).
    - Riparian Frankish.
      - Rhenish.
      - E. Frankish.
      - Hessian.
    - Thuringian
      - Upper Saxon.
      - Erzgebirge.
      - Transylvanian.
      - Meissen.
  - OBER-DEUTSCH
    - Burgundian
      - Swiss
        - Bernese.
        - Hazli.
        - Appenzell.
    - Alemanno-Suabian.
      - Neuhochdeutsch (literary standard).
      - Alsatian.
      - Wurtemberg.
      - Baden.
    - Bavarian
      - Tyrolese.
      - Austrian
        - Styrian.
        - Carinthian.
        - Zips, etc.

GROUP OF OLD SCHOOL TURKISH GENTLEMEN OF CONSTANTINOPLE

The modern Turk is very far from being of purely Mongolian stock. In truth the mixed blood of practically all the peoples of southeastern Europe and western Asia courses in his veins.

guage the sole test of race. In many parts of Germany, where German now prevails, Slavic dialects were spoken down to recent times, and in some places are not yet quite extinct. And in Great Britain it is unreasonable to suppose that the Anglo-Saxon invaders exterminated the native Celtic population, or even drove more than a tithe of them into Wales and the Highlands.

Turks (*tèrks*) or **Ottomans,** the race now dominant in Turkey, lived originally in central Asia. They belong to the Sibiric or Tartar division of the Mongolian race, and reached Europe, probably in straggling bands, before the Christian Era (See Mongolian). To the same race division belong the European Finns, Lapps, Hungarians, Bulgarians, and Basques. Physically and in culture the Turks have become Europeanized, though to a less degree than the related Finns and Magyars. Instead of becoming blond, as the Finns, they have approached the brunette type of southern Europe, probably in part through their frequent intermarriages with the Circassian and other Mohammedan peoples of the Caucasus. In fact, today they are not so much Turkish by blood as Arabian, Circassian, Persian, Armenian, Greek, and Slavic. They prefer to be considered as Arabo-Persian in culture rather than as Turkish. In religion they are almost universally Mohammedan.

The Turks are in the minority in their own country, especially in the European part of Turkey, where the Turks, Greeks, Albanians, and "Slavs" (Bulgarians and Servians are to be found in nearly equal parts. The first three named have been estimated to constitute seventy per cent of the population. No census of Turkey has ever been taken. The following estimates are compiled from various sources. The entire Ottoman Empire, excluding states practically independent, has a population of about 24,000,000. Of these 10,000,000 are Turks. In European Turkey, 1,500,000 out of a population of 6,000,000 are Turks. Here they are without doubt decreasing in numbers. In Macedonia the Turks number about 500,000 out of a population of 2,200,000. Of the latter number, however, only about 1,300,000 are Christians. In the capital itself, Constantinople, the Turks constitute only about one-half of the population of 1,200,000. In Turkey in Asia, on the other hand, the Turkish race is in the majority. The Mohammedans number perhaps 10,000,000 in a total population of 13,000,000 in Asiatic Turkey and Armenia. There are about 500,000 Turks in Bulgaria out of a total population of 4,000,000. The Mohammedan population of Bosnia and Herzegovina—550,000 out of a total of 1,600,000—is mainly Slavic rather than Turkish.

COMPARATIVE CLASSIFICATION OF RACES AND PEOPLES

Showing also the latest estimated population of the various subdivisions throughout the world, together with a view of the numerous races entering into the population of the United States.

Race	Stock	Group	Peoples and Tribes	Estimated Total Population	Races Represented in the United States
Caucasian Race (White)	Hamitic	Egyptians	Copts	800,000	500
			Fellaheen	5,000,000( )	
		Libyans	Berbers (modern)	7,500,000	.....
			Etruscans		
			Assyrians (early)		
			Hittites		
		East Africans	Somalis	1,000,000	.....
		Arabians	Arabs	5,000,000	500
			Bedouins		
		Abyssinians	Ethiopians	9,000,000	.....
	Semitic	Chaldean	*Assyrians* (later)		
			Babylonians		
			Hebrews	11,000,000	2,050,000
			Arameans (Syrians)	2,000,000	50,000
			Samaritans		
		Iranic, or Persic	Hindus	225,000,000	10,000
			Medes		
			Persians	6,500,000	300
			Gypsies	800,000	4,000
		Armenic	Armenians	4,000,000	30,000
	Aryan	Celtic	*Britons*	Celtic population of Europe, 3,200,000; of the world, 9,200,000	Scotch 660,000 Irish: 4,600,000 Welsh: 250,000
			Scotch (part)		
			Irish (part)		
			Welsh		
			Gauls		
			Picts		
		Italic	*Latins* (Romans,		
			Italians (part)	38,000,000	2,100,000
			Roumanians	10,000,000	90,000
			Spanish	50,000,000	1,375,000
			Portuguese	5,000,000	115,000
			French	45,000,000	300,000
		Hellenic	Greeks	6,000,000	110,000
		Illyric	Albanian	1,500,000	3,000
		Teutonic	Scandinavian	13,000,000	.....
			Danish	2,800,000	450,000
			Norwegian	3,000,000	1,010,000
			Swedish	5,500,000	1,450,000
			German	85,000,000	8,300,000
			Dutch	6,300,000	300,000
			English (part)	126,000,000	2,250,000
			Flemish	4,000,000	100,000
			Swiss (part)	2,300,000	300,000
			Austrians (part)	10,000,000	2,000,000
		Lettic	Lithuanians	4,000,000	225,000
		Slavonic	Russians	84,000,000	100,000
			Polish	17,000,000	1,725,000
			Czech:		
			Bohemian	4,000,000	550,000
			Moravian	2,000,000	
			Serbs, Croatians (Servia, Montenegro, Bosnia, Croatia, Slavonia, Dalmatia, Herzegovina	10,000,000	125,000
		Caucasic	Georgians	1,200,000	.....
			Circassians	500,000	.....
	Sibiric	Finnic	Finns	6,000,000	200,000
			Lapps	30,000	.....
			Magyar (Hungarian)	8,500,000	700,000
			Bulgarian	5,000,000	25,000
		Tartaric	Turks	10,000,000	125,000
			Cossacks	4,000,000	.....
			Kalmuks	200,000	500
		Iberian	Basques (in Spain)	800,000	.....
Mongolian Race (Yellow and Brown)		Japanese	Japanese	48,000,000	75,000
			Korean	10,000,000	.....
	Sinitic	Chinese	Chinese	305,000,000	75,000
			Indo-Chinese	35,000,000	.....
			Siamese	1,600,000	.....
			Burmese	10,000,000	.....
	Malay	Polynesian	New Zealand (Maoris)	45,000	.....
			Philippines (part)	7,600,000	7,600,000
			Hawaiians (part)	40,000	40,000
			Samoans	40,000	500
		East Indian	Javanese	25,000,000	
			Dravidians	65,000,000	
			Madagascar (part)	2,000,000	10,000
			Sumatra (part)	3,000,000	
			Borneo (part)	1,500,000	
Negro Race (Black)	Tribes and peoples whose real homes are (1) Central and Southern Africa; (2) Malay Peninsula, Andamans, parts of the Eastern Archipelago and Philippines, New Guinea, Australia; (3) America			(1) 180,000,000 (2) 5,000,000 (3) 25,000,000	 9,850,000
American or Indians (Red)	Tribes comprising: (1) North American Indians; (2) South American Indians; (3) Central American Indians; (4) Patagonians; (5) Eskimo			(1) 500,000 (2) 6,000,000 (3) 7,500,000 (4) 190,000 (5) 40,000	270,000 ....

N. B.—Races in *italic* are either now non-existent or have merged with later peoples thus forming mixed-races.

NAPOLEON AT THE BURNING OF MOSCOW IN 1812

The disastrous Russian campaign of Napoleon in 1812, which resulted in the destruction of the city of Moscow by its own inhabitants to prevent it from falling into the hands of the French, was the virtual turning point in European history. From that time Napoleon's star declined, and Europe was reconstituted a few years later practically as it is today.

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- The Greeks: Glory of the Ancient World
- Rome: Mistress of the World
- The Saracen Empire: Its Fanaticism, Art and Learning
- The Germanic Empire of Charlemagne

LIVING NATIONS OF TO-DAY

COMPARATIVE OUTLINE HISTORY OF MODERN NATIONS

TRANSITION PERIOD FROM THE ANCIENT TO THE MODERN

GEOGRAPHICAL AND HISTORICAL DEVELOPMENT OF THE GREAT POWERS: Great Britain — France — Germany — Italy — Austria-Hungary — Russia — United States — Japan

THE LESSER MODERN NATIONS: In Europe, Spain and Portugal — Scandinavia (Norway, Sweden, Denmark) — The Netherlands — Switzerland — The Balkan States (Bulgaria, Roumania, Turkey, Greece, Servia); In Asia, China, Persia, Turkey; In America, Brazil — Argentina — Chile — Mexico — Canada

DICTIONARY OF HISTORY AND GOVERNMENT, including Great Wars, Great Battles, Dynasties, Rulers, Historic and Literary Shrines, Allusions, etc.

HISTORICAL CHARTS AND TABLES, MAPS AND PLANS

HISTORICAL GEOGRAPHY OF THE WORLD

Showing its Territorial Growth Due to Successive Discoveries

The Known World about 3800 B. C.

THE BOOK OF NATIONS

WE SHALL perhaps gain the best idea of the gradual expansion of the world to-day if we go back to the earliest times of which we have any definite historical records, and from that as a starting point, picture to ourselves the world at important epochs as it was divided among the more civilized nations. In spite of revolutions and the rise and fall of nations, the course of history has been continuous. The periods of history are not separated by gaps or breaks, but really merge gradually one into another. Bearing this in mind, the general history of the world may be viewed in two great divisions—ancient and modern. *Ancient history* begins with the dawn of civilization, and traces the progress of mankind among those nations which have now ceased to exist—or at least have ceased to contribute anything to the world's progress. *Modern history,* on the other hand, deals with the origin and growth of those nations which still exist and are working out the problems and ideals peculiar to their own national life.

THE ANCIENT EXTINCT NATIONS

In the Oriental world we see the beginnings of civilized life—the first successful efforts of man to subdue the earth and to utilize the resources of nature; the beginnings of science and of a well-defined written language; the first evidences of architectural skill in the construction of great buildings; and the first marked tendency in the direction of great empires and of centralized governments. The chief nations may be summarized as follows:

EGYPTIANS.—One of the earliest civilized nations—the great representative of the Hamitic race—developed apart—were not a conquering or aggressive people—wonderful builders in the massive style—made great progress in mechanical arts, and some advances in science—government a monarchy restricted in authority by law, custom, and powerful priesthood—religion a nature-worship—popular worship the adoration of animals—an artistic, industrious and peculiar nation—always wonderful and interesting to foreigners—did not greatly influence others.

BABYLONIANS.—As ancient a race in civilization as the Egyptians—partially of Tartar race, mainly Semitic—made great progress at an early date in science—reached a high pitch of power and civilization—known to us, in great measure, from ruins with inscriptions in cuneiform writing—invented permanent system of weights and measures—great in astronomy—the Chaldæan priests developed into a caste of learned men, continuing (in the later Babylonian and Persian empires) long after extinction of their own nation as an independent power.

ASSYRIANS.—A Semitic people—warlike and conquering race—great in architecture and sculpture—very wealthy and luxurious—empire extended over Asia Minor (east of river Halys), Syria, Phœnicia, Palestine, most of Egypt, Media, and countries on Tigris and Euphrates to Persian Gulf—artistic workers in glass, metals, gems—rule despotic over loosely connected nations.

BABYLONIANS (Later kingdom).—A Semitic people—as a political power ruled for only eighty-seven years, 625-538 B.C., from end of Assyrian power to conquest by Persians under Cyrus—were a commercial and luxurious race—city of Babylon emporium for trade between eastern Asia and western Asia, Egypt and Europe—great in manufactures of woven stuffs and gem-engraving.

HEBREWS.—A pure Semitic race—little influence on political history of antiquity—distinguished by their worship of one God, and for the Scriptures transmitted to future ages—a great monarchy under David and Solomon, then declined—a non-artistic, unscientific nation in ancient history.

PHŒNICIANS.—A pure Semitic people—greatest commercial and colonizing race of early times—distinguished as transmitters of civilization from East to West—never formed one great independent state—several independent cities, sometimes in alliance, sometimes hostile—Tyre and Sidon famous for dyes, glass-making, embroideries, brass-work, weaving of cloth in linen and cotton, ship-building, mining—developers of alphabet still used by modern nations—religion a sensual worship—a crafty, money-making people—Carthage was the greatest of all the Phœnician colonies.

MEDES AND PERSIANS.—Pure Aryans in race—warlike people, great in cavalry and as archers—Median monarchy ended 558 B.C., then Persian monarchy arose—Persians a lively, brave, poetical people, simple in life at first, after their great conquests degenerated into luxury—more like Europeans in civilization than any other Asiatics—were the great ruling power in Asia from time of Cyrus to conquest by Alexander the Great (558-331 B.C.)—first Asiatics that tried to conquer in Europe—signally failed—empire extended over all western Asia, and over Egypt—religion recognized two principles, a good and a bad spirit—had taste in architecture—no literature of importance.

HINDUS.—Until recent times almost isolated from the western world—unwarlike, dreamy specimens of Aryan stock—early advance in civilization—a rich and remarkable religious and poetical literature in Sanscrit, one of the

THE ASSYRIAN EMPIRE AND THE REGION ABOUT THE EASTERN MEDITERRANEAN, 750–625 B.C.

oldest of the Indo-European tongues—first known in real history on invasion by Alexander the Great, 327 B.C.—progress greatly checked by rigid system of castes—government of native princes thoroughly despotic—no free aspirations or political instincts in the people—popular religion grossly superstitious—Brahminism (a philosophic deism), creed of the educated, along with Mohammedanism, introduced by conquest in thirteenth century A.D.—skilled at an early period in mathematics, manufactures, architecture—a tasteful, intelligent, but unpractical, non-historical people.

GREEKS.—In the Greek world we see a finer type of humanity: a versatile intellect, expressed in exalted works of philosophy and literature; a refined æsthetic taste embodied in the most beautiful specimens of architecture and sculpture; and a strong love of freedom, shown in the development of democratic institutions

ROMANS.—In the Roman world we see a more practical genius and a more vigorous manhood; a great capacity for military and political organization; a broad sense of civil justice, expressed in an enduring system of law; a wide cosmopolitan spirit, capable of appropriating the ideas of other peoples—in short, a civilization which expressed the highest unity and broadest culture of the ancient world.

HISTORICAL GEOGRAPHY AND DISCOVERY

No intelligent knowledge of the historical nations is possible without a corresponding knowledge of their geography. The first and most important question that geography answers for us is *where*. Historical Geography answers both *where* and *when?* *Where* is Rome located? *Where* and *when* did the Babylonian Empire exist?

History not only answers the questions *when* and *who* but, in addition, gives us a consecutive account of the doings of civilized mankind in their progress toward the most valued and elevating of social and political blessings. It deals rather with the life of *nations* than with *races* of men; and its special function is to sketch the career and describe the conditions of those great nations whose ideas and institutions, or whose achievements in politics, war, literature, art and science, were remarkable in their own epoch, or, by influencing other nations, helped to make the civilized world what it is now.

WHERE THE FIRST CIVILIZATIONS BEGAN

The first scenes in the drama of human history are laid in two remarkable river valleys—the one formed by the Euphrates and the Tigris in western Asia, and the other formed by the river Nile in northeastern Africa. The Euphrates and the Tigris poured their waters into the Persian Gulf, the Nile flowed north into the Mediterranean Sea. Both these valleys were possessed of a rich, alluvial soil, that favored the early development of industrial life among their dwellers. Along the lower courses of the Asiatic rivers were the Babylonians, and later, by conquest, the Chaldeans. In the upper reaches were the Assyrians. On the banks of the Nile were the Egyptians. Such, according to our present knowledge, is the first historic zone in which the real history of the civilized world began.

In the basins of the Tigris and the Euphrates were several distinct territories: Armenia, or the mountainous region between Asia Minor and the Caspian Sea; Assyria proper, between the Tigris and the Zagros Mountains; Babylonia, the great plain between the lower courses of the Tigris and of the Euphrates, and extending westward to the Syrian Desert; Chaldæa (in the narrower sense, as a province of the Babylonian Empire), west of the Euphrates, at the head of the Persian Gulf; Mesopotamia, between the middle courses of the Tigris and the Euphrates; *Elam* or Susiana, east of the Tigris, and at the head of the Persian Gulf.

THE REGION WEST OF THE EUPHRATES

West of the Euphrates we have the peninsula of Asia Minor which later contained the important Lydian nation, and many Greek colonies connected with later history; Syria, on the eastern shore of the Mediterranean Sea, divided into three distinct parts,—Syria proper; Phœnicia, or the strip of coast between Mount Lebanon and the sea; and Palestine, south of Phœnicia; the peninsula of Arabia, extending southeastward, and having little to do with ancient history.

THE HISTORIC PLATEAU OF IRAN

East of the Zagros Mountains lay Media and Persia proper,—Media, northeastward, towards the Caspian Sea; and Persia, on the tableland of Iran stretching southward to the Persian Gulf. The latter absorbed the great monarchies of Babylonia and Assyria in the sixth century B. C., and extended almost from the Indus to the Mediterranean, Ægean, Euxine, and Caspian Seas, when it had reached the summit of its power.

THE FAR DISTANT ORIENT

Farthest to the east was ancient China, drained by two great rivers, the Hoang and the Yangtze. Its remote situation and the barriers on the west formed by the spurs of the Himalayas, combined to make this land the most isolated of the civilized lands of the Old World.

To the west of China lies India, also drained by two great rivers, the Indus and the Ganges, which rise among the slopes of the Himalayas and flow in different directions to the sea. These two countries—China and India—stood nearly alone in ancient times, separated from the peoples of western Asia by the wide, dry plateau of Iran, and hence these countries did not

THE KNOWN WORLD – ABOUT B.C. 450

ABOUT A.D. 300

exercise a great influence upon the ancient world, or come into historical view until much later.

EGYPT WAS A GIFT TO MANKIND FROM THE NILE

The Nile is one of the longest rivers of the world; rising in the distant lakes of central Africa, it pursues a course of about four thousand miles on its way to the sea. But the part of the valley occupied by the Egyptian people extended only about six hundred miles from the mouth of the river—to the rapids called the "first cataract," on the borders of Ethiopia. The valley is inclosed on either side by low ranges of mountains, which furnish stone suitable for building; and it should be noticed that this abundant supply of stone gave to the Egyptians a great advantage over the Babylonians, who were obliged to use the less durable materials, clay and brick, for building.

The valley of the Nile is only about seven or eight miles in width—except at the delta, where it spreads out into an open plain. Not only has this valley been cut by the Nile, but its fertility was anciently due to the annual overflow of the river, for the climate is dry and rain rarely falls. This river was also the great highway of Egypt, affording a ready means of communication from one part of the country to another. The fertile soil of Egypt was especially suitable for the raising of vegetables and grain. Rice, oats, barley, and wheat grew there in great abundance, so that the country became the granary of the ancient world.

THE DIVISIONS OF UPPER AND LOWER EGYPT

Egypt may be divided into two principal parts. (1) The lower, or northern, part includes the extended plain about the delta, where the soil is most fertile, and where the earliest civilization was developed. It was here that the first empire was established, with its center at Memphis. (2) The upper, or southern, part includes the remainder of the valley as far as the "first cataract." This formed a second area of civilization, with its center at Thebes. In either direction from these two centers the banks of the Nile became dotted with a multitude of towns and villages, each one of which was a seat of industry and art.

THE MOST HISTORIC SEA IN THE WORLD

But the most important center of ancient civilization was the Mediterranean Sea. This body of water formed the world's greatest highway, and was possessed successively by the Phœnicians, the Greeks, and the Romans, who made it an important factor in the development of a wider world commerce and a higher world culture.

Known World about B. C. 450.—About this period the decadence of the great Persian Empire had already begun. Greece was becoming a strong power, and had flourishing colonies all round the Mediterranean and Black Seas, at Syracuse in Sicily, on the southern shores of Italy, at Massilia (the present Marseilles), on the coast of Spain, at Cyrene in North Africa, at Cypress, at Byzantium (Constantinople), and at many points between these.

Carthage had already risen from its condition of a colony to that of a great independent state, which held practically all the north African coast. The Carthaginians had come in contact with the Greeks in Sicily, and in their first trial of strength the Carthaginian army under Hamilcar had been defeated. Rome had been founded for perhaps three hundred years. Already the Romans had taken the lead in Latium, and the Republic was in constant warfare with its neighbors on all sides—the southern Etruscans, the Volscians, and the Æqui.

Thus the great events of this period were clustered round the Mediterranean shores. As yet the unknown peoples of the west and north beyond these were vaguely called the Hyperboreans by the Greeks, "the dwellers behind the north wind;" and eastward, beyond Persia and the Indies, Herodotus could only mark "unknown deserts" on his map.

World About B. C. 325.—This little map represents the short-lived Macedonian empire of Alexander, at the date of his return to Persia, when his power was at its height. To his victorious career the world owed a vast increase of geographical knowledge; all eastern Asia had been unveiled, and the road to India, with its boundless wealth, was disclosed to Europeans.

Westward also, about Alexander's time, the geography of the Greeks was greatly extended by Pytheas, a bold navigator of the Greek colony of Massilia (Marseilles), who, from Gadiera (Cadiz), coasted Iberia and the country of the Celts (France), and reached Britain. He followed the southern and eastern shores of the islands, and, after six days' sail from the Orcades (Orkney Islands), discovered Thule, a land of fogs in the north, which has been variously identified as the Shetland Islands, the Norwegian coast, or even Iceland.

In Italy the Romans were continuing their struggles with the neighboring nations. The whole of southern Etruria had yielded to their supremacy, and was kept in check by Roman garrisons; while towards the south, at this time, a terrible conflict was in progress with the heroic Samnite highlanders. Of Sicily the Carthaginians held the western, the Greek colonists the eastern half, a brief lull having taken place in the fierce wars which had been waging between these powers for the possession of the island, during which the prosperity of the great fortified city and seaport of Syracuse was rapidly reviving.

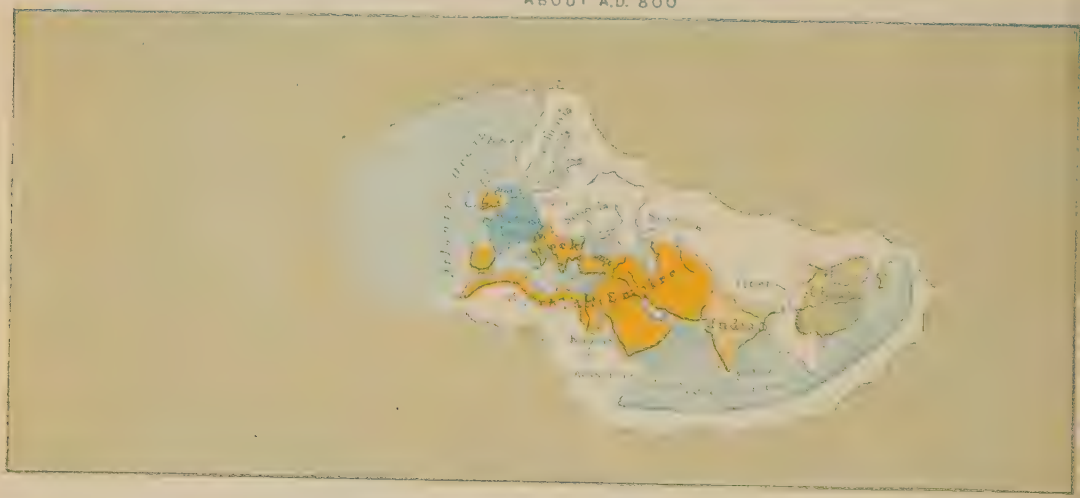
World About A. D. 300.—Almost six hundred years has elapsed, and the Great Roman Empire is already in its decline. A special map of the Roman Empire at its height will be found later on. This little map represents the empire in the time of Constantine.

Under Constantine the Great two great changes took place—the introduction of Christianity as the religion of the State, and the transference of the seat of government from Rome to Byzantium (A. D. 330), which was re-named after the emperor, Constantinople.

Persia at this time, under the Sassanian dynasty, attained a height of prosperity and

ABOUT A.D. 500

ABOUT A.D. 800



ABOUT A.D. 1000

power such as it had never before reached, and against it even the veteran Roman legions could gain no lasting laurels.

In China authentic history begins with the Chow dynasty (1122-255 B. C.) when Confucius and Mincius flourished (600 B. C.). In the next (Tsin) dynasty Shih Hwang Ti (221-209 B. C.) reduced the independent petty states, and built the Great Wall as a protection against the barbarous Hiong-non (Huns) or Tartars of the north. Shortly after the beginning of the Christian era the Chinese seem to have begun intercourse with the Parthians and to have known the Roman Empire as Ta-tsin; and about the time of Constantine's establishment of his new capital the Chinese emperor's court was fixed at Nanking, the southern capital.

The increase of geographical knowledge during the period in which Rome was spreading out its power in all directions could not fail to be very considerable. Already in the latter part of the first century B. C., a general survey of the Roman Empire had been begun by the collection and arrangement of the itineraries of the roads to places in the empire. One of these traces the main roads of all the region stretching from Britain to the mouth of the Ganges in India.

World About A. D. 500.—For more than two centuries prior to this map, the whole of northern Europe, had begun to pour forth wave after wave of barbarian hordes, against the Roman Empire. By the invasions of the tribes of Goths, Franks, Vandals, etc., the western emperors lost their power outside of Italy, and the empire itself ceases to exist in 476, when it is nominally joined to the Eastern Empire. The Vandals had established their rule along north Africa; the Visigoths ruled in Spain; the Ostrogothic monarchy of Theodoric the Great extended over Italy, France, and all the countries round the Alps as far as the middle Danube; and the Franks, under Clovis, had possession of the whole of Gaul between the Loire and Somme.

Persia, still under the energetic Sassanian dynasty, not only maintained its integrity as an empire, but had begun to repel the Roman or Byzantine power in Asia, and had added part of Armenia. Westward, however, the arms of the Byzantine Empire were triumphant, the reign of the Emperor Justinian having been rendered famous by the expedition of his great general Belisarius to Africa, where, after a compaign of two years, he completely overthrew the Vandals and led their king captive to Constantinople. In a second war, Belisarius wrested all southern Italy from the Ostrogoths, pursuing them northward to Rome and Ravenna, and thus began the re-conquest of the peninsula, which was completed by his successor, the imperial general Narses, after which the Ostrogoths disappear as a distinct nation.

At this time, under Khosru, the greatest of the great monarchs of the Sassanian dynasty, the Persian Empire stretched from the Red Sea to the Indus, and from Arabia far into central Asia.

World About A. D. 800.—The end of this century finds three great empires in Europe and eastern Asia: the Mohammedan or Saracenic Empire, the Eastern or Byzantine Empire, and the Frankish Empire of Charlemange. The Mohammedan Empire had spread itself out to central Asia and to Spain, and had already passed the zenith of its greatness. The dynasty of the Ommiades of Damascus had given place to that of the Abassides in the east, though a branch from it had set up an independent Califate at Cordova, in Spain. The Abbaside Haroun-al-Rashid, whose praises are sung by eastern poets, had his capital at Bagdad, on the Tigris, a city which had been founded by his predecessor in 762.

Charlemange had consolidated and extended the Frankish Empire, received the ambassadors sent from the court of Bagdad to salute him, and had been crowned by the Pope at Rome. Irene, the mother of the Byzantine emperor, Constantine VI., had conceived the bold plan of uniting the east and west of Europe in one great empire, by marrying the Frankish emperor, a scheme which was frustrated by her overthrow and her banishment to the Isle Lesbos in the Ægean Sea (802).

Britain, so far as occupied by the Angles and Saxons, was divided into seven (or eight) little kingdoms, known as the Saxon Heptarchy.

World About A. D. 1000.—Germany, or the Eastern Franks, becomes at this time the greatest power in Europe, uniting to itself Upper Italy and Lotharingia.

France, or the Western Franks, early in this century is invaded by the Norsemen or Normans,—bold seafaring adventurers from Denmark and other northern lands, from whom the name Normandy is derived. The kingdom of France, however, began in 987.

The Saracen Empire was divided at the beginning of this century into no less than seven independent califates, of which the most distinguished was that of the Fatimites. The Saracenic civilization in Spain is now at its height. By the end of the century the power of the Saracens in the East is of but little account politically.

The Magyars, or Hungarians, before the end of the century have established a strong kingdom in the southeast of Europe; and to the north the Slavonic states of Poland and Bohemia are planted.

Denmark, Norway, and Sweden are powerful kingdoms by the close of this century and England, now one kingdom, is engaged in struggles with the Danes.

The hardy Scandinavian seamen had pushed back the clouds of ignorance over the vast region of the north Atlantic, and had reached the shores of the American continent nearly five centuries before Columbus. About the year 994 an expedition under Leif, son of Erik the Red, set sail for this new country. The regions discovered were named Helluland (Slateland), probably Newfoundland; Markland, or Woodland, was very probably Nova Scotia; and Vinland, a country named from the wild vine growing there, which some identify with Newfoundland, while others transfer it to the New England coast, opposite the island of Martha's Vineyard.

World About A. D. 1300.—Before the middle of the thirteenth century the vast Mongol

500
Azores
Santa
Cruz

Empire, under Ghengis Khan, had stretched out from China to Poland and Hungary, over all Asia except India and Asia Minor—an empire which far surpassed in extent any that had yet been known on the surface of the globe.

The great Mongol expansion forced the removal of the Ottoman Turks, who retreated from the steppes east of the Caspian to the mountains of Armenia. Othman or Osman, a chief of the tribe, on the destruction of the Seljuk power, obtained possession of Bithynia, attacked the Asiatic portion of the sinking Byzantine empire with success and founded there (1299) the subsequently great empire of the Ottoman or Osmanli Turks, as they are named from him.

In the course of his conquest Genghiz Khan had carried off multitudes of western Asiatics as slaves. Twelve thousand of these, mostly Turks and Circassians, were bought by the Sultan of Egypt (a successor of Saladin), who formed them into a body of troops. From being servants these well-armed slaves rose to be masters in Egypt, and placed one of their own number in the sultanate (1254), thus founding the Mameluke (or slave) dynasty in Egypt, which lasted for nearly three centuries, bringing the country again into great prosperity and power.

Thus, about the year 1300 the once great Mohammedan Empire had been restricted to its original seat, and to the western region of north Africa, all else having fallen into the hands of the Turks. The Calif of Bagdad had taken refuge under the protection of the Mamelukes of Egypt, retaining his spiritual power only; the Ommiade califate in Spain had long fallen.

The English, under Edward I., had incorporated Wales after ten years' contest; Scotland was fighting for independence, led by Wallace and Bruce; and long wars engaged England and France, leading finally to a great increase in French territory and power. Denmark, Sweden and Norway were separate states. In central Europe, Poland and Hungary had been brought to the verge of ruin by the Mongol invasions, which had swept away for the time the divided principalities of Russia. In the south, the old Greek Empire was fast sinking through the assaults on it by the Turks.

The German Empire in this century both loses and gains territory, without material change.

Italy is still divided into independent commonwealths, which more and more fall under the power of princely families or tyrants.

In the Spanish Peninsula there are few geographical changes in this century, but Spain is steadily consolidating into a great power.

The Venetian, Marco Polo, the greatest of medieval travelers, passed seventeen years in exploring the kingdoms of Asia, and opened up to accurate knowledge not only the vast region of the central Asiatic continent, but also the disclosure of the existence of Japan, which he called Zipangu. While Venice opened up new paths to commerce towards the east, Genoa looked westward, sought to open up a new road to India by sailing through the Strait of Gibraltar and round the southern extremity of Africa. It was Genoese who first, in modern times, ventured upon the Atlantic; discovered the Canaries, Madeira, and the Azores; and who first felt their way along the west coast of Africa.

World About A. D. 1500.—Previous to this century the nations with which we have been concerned has been restricted to Europe, a little of western Asia, and a small part of northern Africa. An immense enlargement of these bounds now suddenly occurs in consequence of the application of the compass to navigation. From this time dates the period of greatest maritime enterprise and discoveries.

The Portuguese took the lead in bold projects of adventure by sea. The Cape of Good Hope was discovered and doubled by Bartholomew Diaz in 1487, and in 1498 the feat of reaching India by water was accomplished by Vasco da Gama, who, rounding the Cape of Good Hope, reached Calicut in Malabar.

The general excitement about maritime discovery among the Portuguese suggested to Columbus the bold plan of reaching India, not by way of Africa, but by steering to the west across the Atlantic. The result of his voyage was the final discovery of the American continents. India he did not reach, but discovered instead, the island of Guanahani or San Salvador, in 1492, the main continent being discovered a few years later (June 24, 1497) by John Caboto, or Cabot, a Venetian sailor.

In the far east China had recovered its independence under the Ming dynasty, and its supremacy was acknowledged over Mongolia and eastern Turkestan, though the states of Tonquin and Cochin China, in the southern peninsula beyond India, had assumed a political independence. Western Asia had been reconquered by Timur, or Tamerlane, of western Turkestan. The Ottoman Turks had extended their European territory to its widest limit over the ruins of the Greek Empire; and Russia had become a united kingdom under Ivan the Great, and threw off the Tartar yoke.

In western Europe, the Swiss mountaineers had secured their independence. France was recovering from the calamities inflicted on it by the English, who had all but lost their hold on the land. In the south the reaction of Christendom against Mohammedanism had begun. The Christian kingdoms of Spain and Portugal had driven back the Moors across the Straits into Africa, and had consolidated their strength over the whole Peninsula. The Moors in turn settled along the north African coast. Morocco at this time had been formed into a monarchy, and enjoyed great prosperity.

World About A. D. 1600.—Spain is the chief power at this time. Besides vast continental dominions in the New World, its European possessions comprised the whole of the Spanish Peninsula, the Netherlands and other lands of the House of Austria, the Sicilies, Sardinia, and Milan. But, by the revolt of the United Provinces of the Netherlands, Spain loses a considerable portion of her territory before the end of the century.

ABOUT A.D. 1600

The German Empire continues, but more as a dignity than as an independent power. The emperors are uniformly chosen from the princes of the House of Austria, which now by its hereditary possession becomes one of the chief powers of Europe. In the person of the Emperor Charles V., who united the crown of Spain with the sovereignty of Austria, the imperial power reached its greatest extent.

France is engaged in wars civil and religious and foreign, but without much change of territory, except in America, where some colonies were established. England makes some attempts at colonization in America during this century, but the real settlements begin in the next.

Italy, during this period, is a battle-field of contention among the rival princes of Europe. The peninsula was made up of principalities and commonwealths, some of which were independent, but the most of which, during the greater part of this century, were under the dominant influence of Austria and of Spain. The northern provinces of the Netherlands throw off the yoke of Spain, and are united in a federal commonwealth. The union of Denmark, Norway, and Sweden ceases in the early part of this century, by the independence of Sweden, which now plays an important part in European history. Poland is an important state in this century, with extensive possessions.

The Turkish or Ottoman Empire is largely extended in this century by the annexation of Syria, Egypt, a great part of the northern coast of Africa, and the conquest of a large part of Hungary.

In Asia the Chinese Empire remained unshaken; Persia had again become an independent empire; the Mohammedan Moguls had begun to reign in northern India; the once great Tartar empire had been reduced to the states east of the Caspian. In the north, Russia was spreading eastward over Asia, and had come in contact with the Ottoman Empire, now expanding to its greatest extent in the South, and with Sweden in the northwest. The great Reformation had passed over Europe, separating its Catholic states of the south from the Protestants of the north, and giving rise to fierce wars and many political changes. Maritime discovery and adventure and commerce were being eagerly extended by the nations of western Europe. Four times the world had been circumnavigated—by the Portuguese Magellan, by the English Drake and Cavendish, and lastly by the Dutchman Van Noort. Spain had extended her conquests to Mexico, Peru, and Chile, which were now ruled by Spanish viceroys. The Portuguese had established themselves firmly on the African shores; their possessions and settlements in the East Indies included the Malabar coast of India, Ceylon and Malacca; and their traffic reached to all the islands of the Asiatic archipelago, to China and Japan.

The English and Dutch, after vainly seeking an independent highway to the northeast or northwest through the ice-fields of the Arctic region, had become formidable rivals of the Spaniards and Portuguese in their own lines, both in the West Indies and round the Cape of Good Hope to the eastward.

World About A. D. 1700.—In Europe, France under Louis XIV., now becomes the leading power, and makes great accessions of territory. England also becomes one of the important nations, and, besides being engaged in civil and foreign wars, was planting colonies in America and in India. Austria had increased her power in Italy and Hungary. The Spanish monarchy is broken up, and Spain sinks to an inferior position. Prussia has risen into prominence under the great elector, Frederick William. The United Provinces held a high place and had been engaged in a long struggle with France. Italy had fallen to a low condition. Savoy was slowly gaining in power, and Venice was engaged in wars with the Turks. Sweden was at the height of its power and possessions. Russia is rapidly rising, and Poland is declining. The Turks press forward into Austria, from which they are driven out, and make some important conquests in other parts; but their power is on the decline.

In Asia, this was the period at which the Mohammedan Empire in India was raised to its highest point of splendor and greatness by Shah Jehan, the "King of the World," and by his son, the famous Aurungzeb, the crafty and ambitious "reviver of religion." It was during these reigns that the English began to gain a hold on India.

Outside of Europe it cannot fail to be observed how completely the spread of knowledge on the outer borders of the known world was controlled by events which took place in western Europe. Chief of these was the gradual crippling and decay of the maritime supremacy of Spain and Portugal, and the rise of that of the Dutch and British into strength. Maritime enterprise had passed to Holland, England, and France.

In America the British dominion was extended by the formation of the Hudson Bay Company. In 1690 this fur company had built several forts and factories on the coasts, whence from time to time their operations extended inland.

The French also, after La Salle first descended (1682) the great river, Mississippi, "the father of waters," invaded Spanish claims by settling in Louisiana, about the mouth of the great river, in 1699.

World About A. D. 1800.—In Europe France holds about the same position till near the close of the century, when the Revolution breaks out, and the republic makes large accessions of territory in the Austrian Netherlands, Savoy, Piedmont, and the islands of the Mediterranean. Through the very enormity of the excesses of the revolutionary period, the form of government soon gave way to a new constitution, known as the Directory, under which Napoleon Bonaparte came to the front as the central figure in the affairs of Europe. During these last years of the century the French Republic was engaged in constant wars with the various coalitions formed against it by the other powers. In the year 1799 the Directory came to an end, and the supreme control was vested in the hands of Napoleon, who was made First Consul.

ABOUT A.D. 1800

[Hansen, 1895]

ABOUT 1915

Great Britain is engaged in foreign wars, and has lost a large part of her American colonies, which win their independence in 1783. The British dominion in India is greatly extended during this period. The scattered settlements of British merchants and of the East India Company, now became firmly established by the military achievements of Clive. The French and native troops were overthrown, and one after another the provinces of India were brought under English control. Spain rises very considerably in importance. The United Provinces become in the last years of the seventeenth century a dependency of France. The Turkish dominion, though with occasional successes, is on the decline. Prussia becomes an important European state under Frederick the Great. Austria is engaged in frequent wars, with somewhat diminishing power. The German Empire, though still in existence, is more a dignity than a power, its functions being wielded chiefly by the great kingdoms of Austria and Prussia. Russia, under Peter the Great, rises to a front rank among the states of Europe and makes large gains of territory.

In the latter part of the seventeenth century Poland disappears from the map of Europe, the territory being divided between Russia, Prussia, and Austria; and in 1795 Poland, as a kingdom, ceased to exist.

In America, the United States of America come into being as an independent nation in 1783.

France, at the beginning of the nineteenth century under Napoleon I., was the chief power in Europe. The battle of Waterloo finally overthrew the empire of Napoleon, and brought to an end the succession of wars which had lasted with little interruption for twenty-three years. By the terms of peace agreed upon by the Allies, the conquests of France were given up, and the boundaries of the European states re-established.

From the starting-point of this re-arrangement of the map of Europe we may now follow rapidly the subsequent changes of territory in each of the leading states of Europe which have given them the limits they occupy at the present day.

England rises to the front rank of European states, by her part in the Napoleonic wars. In the nineteenth century she made some small acquisitions of territory in Europe, and greatly extended her colonial empire.

The marked feature of the political movements in Europe in the last quarter of the nineteenth century was the tendency to consolidate the petty and weak states, into which a great part of the Continent had been broken up, into strong central governments. This tendency is shown specially in the confederation of the smaller German states under the leadership of Prussia, and the formation of the present German Empire which has become the first military power in Europe. The old German Empire came to an end in 1806. In Italy the same tendency has shown itself in the establishment of the new kingdom of Italy, with Rome for its capital.

Austria was entirely separated from Germany, and united into one state with Hungary. Russia has become one of the greatest European powers. Denmark lost considerable territory, taken from her by Prussia. The new kingdom of Belgium has been formed. Spain loses Mexico and the republics of Central America. Greece secured its independence, and became a kingdom. The power of Turkey is still declining.

In America, the United States were greatly increased by the addition of new States and Territories. The attempt at secession of the southern States in 1861 proved abortive; and the restored Union, freed from the disturbing element of slavery, advanced in wealth, power, and the arts of peace, at a rate of progress never equalled in past history.

Mexico, which had belonged to Spain, revolted and became an independent republic.

In Asia, Japan renounced its former isolation, opened her ports to foreign trade, and changes of almost startling rapidity were adopted in the country. The whole political constitution of the empire was remodeled; and Japan took rank with the great powers of the world.

The continent of South America was apportioned among the various present-day countries; Africa has been colonized and divided among the European powers; and the commonwealths of Canada, Australia and New Zealand have taken a foremost place among the colonies of Great Britain.

World About A. D. 1915.—In the realm of geographical discovery the supreme events were the attainment of the North Pole by Admiral Peary, and that of the South Pole by Captain Roald Amundsen.

The geographical changes resulting from the great European War are noted in connection with the nations and colonies directly affected.

THE WORLD'S GREATEST EXPLORERS

Explanation of Abbreviations.—Arab., *Arabian*; Brit., *British;* Carthag., *Carthaginian;* Dan., *Danish;* Dut., *Dutch;* Egypt., *Egyptian;* Eng., *English;* Fr., *French;* Gen., *Genoese;* Ger., *German:* Ital., *Italian;* Norw., *Norwegian;* Port., *Portuguese;* Rus., *Russian;* Scot., *Scotch:* Span., *Spanish:* Swed., *Swedish;* U. S., *United States;* Ven., *Venetian.*

B.C.1400-1250.—Egyptians make invasions of Habesh, Arabia, Phœnicia, Syria.

B.C.1350(?).—Greeks undertake Argonautic expedition to Colchis.

B.C.1000.—Phœnicians voyage to Ophir, Gades, Britain.

B.C.750.—Greeks extend colonies in the Mediterranean and Pontus Euxinus.

B.C.700.—Samians discover Spain (Tartessus) for the Greeks.

B.C.600.—Phœnicians circumnavigate Africa by order of Necho.

B.C.—Himilco (Carthag.) visits Atlantic coast of Europe, Sargasso Sea. Said to have visited Britain.

B.C.500.—Anaximander (of Miletus) makes the first maps.

B.C.500.—Hecatæus (of Miletus) writes the first geography.

B.C.470.—Hanno (Carthag.) coasts west Africa as far as Cape Palmas.

B.C.330.—Pytheas of Massilia sails to Thule, North Sea, Scandinavia.

B.C.330.—Nearchus (Macedon.) sails from the Indus to Red Sea.

B.C.329-325.—Alexander the Great makes expedition to Iran, Turan and India.

B.C.290.—Egyptians navigate the east coast of Africa.

B.C.218.—Hannibal crosses the Alps.

B.C.120 (about).—Eudoxus of Cyzicus attempts circumnavigation of Africa.

B.C.61-58.—Romans, under Julius Cæsar in Gaul, Germany, and Britain.

B.C.30 (since).— Romans extend their geographical knowledge and commerce as far as central Asia.

B.C.20—Strabo (Greek) describes Roman Empire and first mentions Thule and Ireland.

B.C.15.—Tiberius discovers the Lake of Constance; Drusus, the Brenner Pass.

A.D.84.—Roman general, Agricola, circumnavigates Britain.

150.—Claudius Ptolemy (Egypt.) constructs his geography and atlas.

518-21.—Hoei-sing (Chinese) visits Pamirs and Punjab.

671-95.—I-tsing (Chinese) visits Java, Sumatra and India.

861.—Norsemen discover the Faroe Islands. North Cape of Europe rounded.

865.—Naddod (Norse) discovers Iceland. Visited by Irish monks about 795.

876.—Gunnbjörn (Norse) reaches Greenland coast. Rediscovered by Erik the Red (983).

985.—Erik the Red (Norse) colonizes Greenland.

1000(?).—Lief Erikson (son of Erik the Red) discovers Newfoundland (Helluland), Nova Scotia (Markland), and coast of New England (Vinland)[?].

1154.—Edrisi (Sicily), geographer to King of Sicily, produces his geography.

1200 (*about*)—Arabian trading merchants discover Siberia.

1253.—Ruysbroek reaches Karakorum, the ancient seat of the Mongol Empire.

1271-95.—Marco Polo (Venet.) travels in central Asia, China, India, Persia.

1290.—Genoese reach the Canaries, Azores, etc.

1325-52.—Ibn Batuta (Arab.) travels through the whole Mohammedan world, northern Africa, eastern Africa, southern Russia, Arabia, India and China.

1327.—Sir John Mandeville (Eng.) travels in India.

1415-60.—Prince Henry (Port.) gives an impetus to Portuguese voyages of discovery.

1419-20.—J. Gonzales and Martin Vaz (Port.) discover Porto Santo and Madeira.

1442.—Nuno Tristao (Port.) reaches Cape Verde, etc.

1460(?).—Cintra and Costa (Port.) sail to coast of Guinea.

1474.—Toscanelli (Ital.) sends Columbus his map showing the western route to Cathay (China).

1485.—Diego Cam (Port.) reaches the mouth of the Congo river.

1487.—Bartholomew Diaz (Port.) rounds Cape of Good Hope.

1492-98.—Columbus (Gen.) discovers America, West Indies, Trinidad, Cuba, etc.

1497-98.—John Cabot (Anglo-Ven.) sails along eastern coast of America from Labrador as far as Florida.

1498.—Vasco da Gama (Port.) finds route to India by Cape of Good Hope.

1499.—Amerigo Vespucci (Ital.) discovers Venezuela, and that America was not "part of Asia."

1499.—Pinzon (Span.) discovers mouth of Amazon river and Cape St. Roque.

1500.—G. Cortereal (Port.) reaches entrance of Hudson Strait, called by him Strait of Anian.

1500.—Alvarez Cabral (Port.) coasts Brazil (named by him Ilha da Vera Cruz, being southern part of Bahia State).

1502.—Columbus(Gen.) reaches central America on his fourth voyage.

1512.—Ponce de Leon (Span.) reaches Florida.

1513.—Portuguese reach the Moluccas.

1513.—Balboa (Span.) crosses Isthmus of Panama and discovers Pacific Ocean.

1516.—Solis (Span.) reaches La Plata.

1517.—Sebastian Cabot (Eng.) discovers Hudson Strait.

1519-21.—Cortez (Span.).—conquers Mexico.

1519-21.—Magellan (Span.) first to circumnavigate the globe. Passes through the Strait of Magellan, crosses the Pacific, and discovers the Philippines.

1534.—Pizarro (Span.) completes the conquest of Peru.

1535.—Diego d'Almagro (Span.) conquers Chili.

1535-42.—Jacques Cartier (Fr.) finds Gulf of St. Lawrence. Ascends river to Hochelaga (Montreal).

1539.—Francesco de Ulloa (Span.) explores Gulf of California.

1540 (about).—French continent of Australia seen by French sailors.

1541.—Pizarro and Orellana (Span.) discover Amazon river.

1542.—Antonio de Mota first reaches Japan.

1542.—Ruy Lopez de Villalobos (Span.) discovers Pelew Islands, and takes possession of Philippine Islands for Spain.

1542.—Pinto (Port.)—visits Japan.

1553.—Sir H. Willoughby (Eng.) reaches Nova Zembla.

1576.—Frobisher (Eng.) coasts Labrador and Baffin Land.

1577-80.—Sir F. Drake (Eng.) made second circumnavigation of the globe, and first saw Cape Horn. Explored western coast of North America nearly as far as Vancouver Archipelago.

1587.—J. Davis (Eng.) finds Davis Strait.

1596.—Barentz and Heemskerk (Dut.) discover Spitzbergen, Bear Islands, etc.

1598.—Mendaña (Span.) discovers Marquesas Islands.

1606.—Quiros (Span.) reaches Tahiti (Sagittaria), and other South Sea Islands.

1606.—Torres (Span.) discovers Torres Strait. Dutch reach Australia.

1608.—Champlain (Fr.) discovers Lake Ontario.

1610.—H. Hudson (Eng.) reaches Hudson Bay and makes discoveries in North America.

1614-17.—Spillbergen (Dut.) circumnavigated the globe.

1616.—W. Baffin (Eng.) enters Baffin Bay.

1616.—La Maire and Schouten (Dut.) round Cape Horn.

1616.—Dirk Hartog (Dut.) sails up west coast of Australia.

1618.—G. Thompson (Eng.) sails up Gambia.

1642.—Abel Tasman (Dut.) discovers Van Diemen's Land (Tasmania) and New Zealand.

1643.—Vries (Dut.) explores eastern coast of Japan, Saghalien, and Kurile Island.

1645.—Deshnev (Cossack) rounds east cape of Asia from the Kolyma to the Anadyr.

1660.—French discover the lake region of the St. Lawrence.

1673.—Marquette and Joliet (Fr.) explore the Mississippi from the north.

1725-43.—Russians explore the coasts of Siberia.

1728 and 1741.—Bering (Dan.) and Tishirikov (Rus.) explore Bering Strait and the northwestern coast of America.

1768-79.—Capt. Cook (Eng.) voyages round the world. Surveys the Society Islands, Sandwich Islands, eastern coast of Australia, Cook Strait in New Zealand, Antarctic Ocean, northwestern coast of America, etc.

1770.—James Bruce (Scot.) discovers sources of the Blue Nile.

1770.—Liakhov (Rus.) discovers New Siberian Islands.

1785-88.—La Perouse (Fr.) explores north of Japan, Saghalien, etc.

1789.—A. Mackenzie (Scot.) explore the Mackenzie river.

1792.—Vancouver (Eng.) visits Vancouver Island, discovered by Perez, 1774. Exploration of the northwestern coast of America.

1795-1806.—Mungo Park (Scot.) journeys to and explores the Niger districts.

1799-1804.—Alex. von Humboldt (Ger.) makes explorations in South America and writes "Cosmos."

1801-1804.—Flinders (Eng.) explores southern coasts of Australia.

1803-6.—Krusenstern (Rus.) surveys in Sea of Japan and Sea of Okhotsk, Saghalien, etc.

1804-6.—Lewis and Clark make extensive explorations in northwestern United States from the Mississippi to the Columbia river.

1805-9.—Salt (Eng.) makes visit to Abyssinia.

1807-8.—Klaproth (Ger.) makes exploration of the Caucasus.

1819.—Long (U. S.) makes exploration of Rocky Mountains.

1819.—Wm. Smith (Eng.) explores South Orkney Islands and South Shetlands. Visited by Weddell in 1822.

1823.—Wrangel (Rus.) discovers Wrangel Land.

1823.—Denham and Clapperton (Eng.) discover Lake Chad.

1825-26.—A. G. Laing (Scot.) reached Timbuktu from Tripoli, Africa.

1827-8.—René Caillie (Fr.) made journey from Kakandy to Timbuktu and Morocco, Africa.

1830-32.—Biscoe (Eng.) discovers Enderby Land and Graham Land.

1831.—Sir J. C. Ross (Eng.) finds magnetic North Pole.

1832.—Laird and Oldfield (Scot.) explore the Niger and Benué rivers.

1835.—Sir F. Schomburgk (Ger.) makes explorations in Guiana, South America.

1837.—Wood (Eng.) discovers sources of the Oxus.

1840.—Trümmer discovers remains of ancient Nineveh.

1841.—Sir James C. Ross (Eng.) discovers Victoria Land, with volcanoes Erebus and Terror.

1841-73.—D. Livingstone (Scot.) spends thirty years' travel in central South Africa.

1845.—Sir John Franklin (Eng.) sails on his last voyage never to return.

1848.—Rebmann and Krapf (Ger.) discover Mt. Kilima-njaro. Sighted Mt. Kenia.

1849-55.—Richardson and Barth (Eng.-Ger.) explore western Sudan and Sahara.

1850.—Sir R. M'Clure (Irish) discovers Northwest Passage.

1852-4, 1861.—Sir C. R. Markham (Eng.) makes explorations in Peru.

1856-59.—Du Chaillu (Fr.) explores basin of Ogowé river, west Africa.

1858.—Sir R. Burton (Scot.) discovers Lake Tanganyika.

1858.—Speke and Grant (Brit.) discover Victoria Nyanza.

1860.—Sir S. Baker (Eng.) explores Upper Nile. Discovers Albert Nyanza, 1864.

1867-72.—Richthofen (Ger.) makes extensive explorations in China.

1869.—G. Nachtigal (Ger.) makes explorations in Lake Chad region and central Sudan, Africa.

1870-1886.—Prejevalsky (Rus.) journeys in Mongolia, Tibet, etc.

1872.—Payer and Weyprecht (Austrian) explore Franz Josef Land.

1872-76.—"Challenger" Expedition (Brit.) explores the depths of the oceans.

1874-75.—Lieut. Cameron (Eng.) crosses equatorial Africa.

1876-90.—H. M. Stanley (Eng.) explores Congo Basin; Mt. Ruwenzori; Forests on the Aruwimi, etc. Africa.

1878-79.—Nordenskjold (Swed.) finds northeast passage.

1878-89.—Thomson (Scot.) journeys through Masai Land, British South Africa, Sokoto, Morocco, etc.

1878-85.—Major Serpa Pinto (Port.) twice crosses Africa.

1878-92.—Emin Pasha (Ger.) travels and surveys in Equatorial Africa.

1879.—Moustier and Zweifel (Swiss) find sources of the Niger.

1881-85.—Greely (U. S.) discovers Grinnell Land and northwestern coast of Greenland.

1885.—Wiesmann (Ger.) journeys across Africa from west coast, Congo Basin.

1886.—Peary (U. S.) explores North Greenland.

1887.—Capt. Younghusband (Eng.) travels from Pekin to Kashmir.

1893-96.—Nansen (Norw.) reached his "Farthest North" in lat. 86° 13′ 6″ N.

1897.—Jackson (Scot.) makes surveys and explorations in Franz Josef Land.

1893-97.—Sven Hedin (Swed.) makes explorations in north central Asia.

1895-96.—Pr. Henri d'Orléans travels in Tonkin and China.

1897.—Andrée (Swed.) attempts to cross over the North Pole in a balloon, with fatal results.

1898-99.—De Gerlache (Belgian) attempts to reach the South Pole with the "Belgica," first ship to winter within Antarctic circle.

1899.—Major Gibbons makes explorations in Congo and Zambezi headwaters.

1900.—Borchgrevink (Brit. Ex.) reached lat. 78° 50′ S. via Victoria Land.

1900.—Duke of Abruzzi (Ital.) reached lat. 86° 33′ N. via Franz Josef Land.

1900-02.—Sven Hedin (Swed.) made important journey in central Asia.

1908.—F. A. Cook (U. S.) claims to have reached the North Pole, April 21.

1909.—R. E. Peary (U. S.) reached the North Pole, April 6.

1911.—Roald Amundsen (Norw.) reached the South Pole, December 14.

1912.—Capt. Scott (Eng.) reached the South Pole, but perished before returning.

COMPARATIVE HISTORY OF NATIONS

Showing their Origin, Chief Events, Changes or Extinction, from the Earliest Period to the Present

I. *FROM EARLIEST HISTORIC RECORDS TO THE TIME OF ABRAHAM, X — 2250 B. C.

The earliest history of mankind, so far as we now know, begins with the peoples known as Semites. Northern Arabia is generally accepted as their primitive home. Issuing thence, they conquered or settled Babylonia and Egypt, and through amalgamations with the native races (of which we know very little), became the earliest historic Babylonians, Assyrians, and Egyptians. Historians sometimes assume that the native races were Mongolians, traces of which still persist in China, Thibet, Finland, The Caucuses, and perhaps, among the American Indians.

B. C.	Greeks (Cretans and Mycenæan)	Egypt (*Heb.* Mizraim)	Border Peoples (Between Egypt and Babylonia)	Babylonia (*Heb.* Shinar)	Border Peoples (East of Babylonia)
		I. Prehistoric Period		**I. Sumerian Period**	
5000	5000. Extensive excavations in Crete reveal a prehistoric civilization before the Bronze age.	5000. Egyptian records name the Gods as the earliest rulers and Kings, who were decendents of gods, succeeded them. Actual history begins by revealing, in the Nile valley, a number of districts or nomes held together chiefly by a religious bond. 4241. Earliest fixed date marking the introduction of the calendar.	A variety of tribes and peoples dwelt on the ill-defined borders of Egypt and Babylonia. We come to know their names later through their attacks upon the various states. These tribes and other migratory peoples from the older Semitic centers became the founders of the Syrian states and Asia Minor.	5000. Government in Babylonia had reached the form known as the city state. The southern group of cities (known collectively as Sumer) comprised Eridu, Lagash (Shirpurlo), Ur, Larsa, Uruk (Erech) and Isin; the northern group (known as Accad or Akkad) comprised Agade (Accad) Sippar, Nippur, Kutha, and later Babylon.	Out of these tribes developed the Elamites Medes, Persians, and Hindus.
4000		4000. Pre-dynastic kingdoms flourish in Upper and Lower Egypt.		4000. Lugalzaggisi of Uruk first great conqueror made expeditions to the Mediterranean and north of Mesopotamia.	
		3800-3600. Pre-dynastic kings Ka-ap and Ro are placed within these dates according to recent interpretations of tombs and vases.		**II. Semitic or Chaldean Period** 3800. Sargon I. begins to rule. He and his son Naram-Sin kings of Agade, extend their conquests to Armenia, Elam. Arabia and the Mediterranean. *These reigns were an early "Golden Age" of Babylonia.* 3750. Naram-Sin built temple of Sun-god at Sippur. Fusion of Sumerians and Semites follows his reign.	
		II. The Old Kingdom (Includes Dynasties 1 to 10) 3400. Accession of Menes and beginning of dynasties. Under Menes the kingdoms were unified. Tombs erected at Abydos by successive kings; wars with Libyans and others; mining in Sinai.			
3000	**I. Prehistoric Period** 3000-2500. Rising civilization on coasts and islands of the Aegean Sea, and in Crete.	2900-2750. Fourth dynasty is most important Kings memorialized by Pyramids at Gizeh and Abu Roash. Capital probably at Memphis.		3000. The Kings of Ur. Under this dynasty Ur became the seat of government. Temples were built in both North and South.	3000. Assyria (Asshur) founded by a colony from Babylonia. Nineveh also in existence.
			2700. The Phœnicians settle on the Sidonion coast and build Aradus (Arvad); later Tyre and Byblos.	2800. Gudea, priest-king, or governor of Lagash (Shirpurla or Tello) became the chief ruler. Built a palace. temples and statues of bronze.	
		2590-2570. Primitive sea-voyages made to Palestine. Government centralized at Memphis. Landed nobles in evidence.		2600-2400. Dynasties of Isin and Larsa, respectively. This was a period of strife among the various centers.	
2500	2500. The cities of Mycenæ and Tiryns already founded.	2445-2160.[1] Kings resided at Heracleopolis; numerous struggles with Thebes to which seat of government was finally removed.	2500. Semitic (Amoritic) migrations into Syria and Palestine, about Jerusalem.	2400. First Babylonian dynasty. The South lost its political power and the city of Babylon became for the first time the seat of government.	2400. Chedorlaomer, king of Elam, invades South Babylonia.

*All dates down to the First Olympiad, 776 B. C., are almost wholly conjectural. Dates here given, however, are from the latest and best authorities.

II. FROM THE AGE OF ABRAHAM TO THE RISE OF ASSYRIA, 2250-1100, B. C.

GREAT EVENTS OF PERIOD. Abraham becomes first great leader of the Hebrews. Egyptian revolt from the Shepherd Kings. New Egyptian empire. Rise of Assyria—originally settled by emigrants from Babylonia. Wars with Babylonia. Sidon, a Phœnician city, at its zenith. Phœnician colonies established round the Mediterranean. Advanced civilization in Crete. Exodus of the Hebrews from Egypt under Moses. Hittites rise to great power, contending equally with Egypt and Assyria.

B. C.	Greeks	Egypt	Hebrews and Phœnicia	Babylonia-Assyria	Border Peoples
			I. Patriarchal Age (2250-1200)	**III. Early Babylonian Empire** (2250-1750)	
2500		2250. Rise and triumph of Thebes.	2250 Period of ABRAHAM, patriarch of the Hebrews, who left Ur, wandered north to Horan and finally entered Canaan (Palestine).	2250. HAMMURABI (Amraphel?), great ruler and lawgiver, united the whole of Babylonia. His code of laws one of the most important of Oriental discoveries. Under him Babylon reached high degree of culture. 2100. Second Babylonian dynasty; lasted about 300 years.	
2000	2000-1000. Achæans and Greeks settle in Greece proper, and Ionians in Asia Minor. 1800-1600. "Golden Age" of Cretan civilization. Great palace at Knossos completed.	**III. Middle Kingdom** (Includes Dynasties 11 to 17) 2000-1788. This period reached its highest development in the Twelfth dynasty, which was Theban. Obelisks, public works, regulation of Nile, Lake Mœris, and the Labyrinth belong to this period. 1788-1580. The HYKSOS, or Shepherd Kings, conquer Egypt and rule about 100 years. The invaders introduce the horse into Egypt. Period of comparative obscurity.	2000. Semitic emigrants enter Phœnicia. 1800. Hiksos (Hittites?) consolidate Syrian power at Kadesh and overrun Egypt.	**IV. Kassite Period** (1750-1150) 1750. Third, or Kassite, dynasty of foreign kings in power for nearly 600 years.	1800-1500. Assyria ruled by patesis or governors. 1750. The Kassites, a mountain people north of Elam, subdue Babylonia. An Elamite dynasty with its capital at Susa, gave rise to the Persian nation (1750-836.)
1500		**IV. The Egyptian Empire** (Includes Dynasties 18-20) 1580. After the expulsion of the Hyksos, Egypt was organized as a military state. Syria was conquered and made tribute by 1500. 1479-1447. Thutmose III. rules at Thebes and the Empire increased rapidly in power and extent. Egyptian fleet was developed, temple at Karnak erected.	1550. Phœnicia made tributary to Egypt. 1500-1220. Palestine under Egyptian domination.		
1400	1400. Probable Mycenæan invasion destroyed Cretan civilization. 1400-1300. Bloom of the Agean and Mycenæan civilization.	1414-1383. AMENHOTEP III., Great king, called the "Magnificent." Built temple at Luxor and elsewhere. Tel-el-Amarna Letters with Syria and Babylon. 1383-1365. AMENHOTEP IV. Very important reign. Official religion changed from polytheism to monotheism; chief seat of worship removed from Thebes to Tel-el-Amarna. Syria lost. 1326-1300. SETI I. Restorer of ancient monuments; great temple at Abydos; began great hall at Karnak; tomb in Valley of Kings.	1350. JOSEPH in Egypt. Hebrews settle in Goshen.	1400. BURNABURIASH, greatest of Kassite kings, established political relations with Egypt. settled boundary with Assyria. See Tel-el-Amarna Letters.	1350. Great expansion of Assyria; capital removed from Asshur to Kalkhi (Ninevah).
1300		1300-1234. RAMESES II., the Great. Subdues Syria at Kadesh; built temples at Abu and Simbel; built Pithom and Raamses. Supposed Pharaoh of the Israelite oppression.	1300. Period of Sidon's greatest power.	**V. Period of Decline** (1300-745) 1300. Kassites absorbed into the Semitic population of Babylonia.	1275. Continuous struggle between Assyria and Babylonia.
1200	1200. Dorian invasion ended the grand prehistoric age of Greece. 1193-1184. TROJAN WAR.	1234-1214. Merneptah drove out foreign invaders. Supposed Pharoah of the Exodus. 1202-1171. RAMESES III., greatest king in twentieth dynasty. Built temples at Karnak and Medinet Habu. Great naval battle at Pelusium. **V. Decay of the Empire** (1150-525)	1250. Oppression of the Israelites. 1220. Exodus of the Israelites under MOSES. **II. Period of the Judges** (1160-1020)	1250-1210. Decline of Babylonian power and rise of Assyria. 1100. Babylon subjected by TIGLATH PILESER I. of Assyria. Great expansion of Assyrian empire.	1250. King of Assyria conquers Babylon and rules seven years.

III. FROM THE DEVELOPMENT OF THE ASSYRIAN EMPIRE

GREAT EVENTS OF PERIOD. 1100-1000: Heroic age of Greece; Hebrews reach their highest Europe and into British Isles. 1000-900: Homeric age. Celts already in Britain, with bronze 800-700: Ethiopian supremacy in Egypt. Assyrian conquests continue; Tiglath-Pileser III.; Assyrian empire. Media rises to power. Perhaps last migrations from the Aryan center—he ravages Egypt. The seventy years' captivity of Judah. Rise of Persia. Founding of the

B. C.	Rome	Greeks	Egypt	Phœnicia-Lydia Phrygia
		II. Formation of Greek States (1100-500)		
1100	1100. The Etruscans already in central Italy.	1100-950. Great migrations in Greece of Dorians and Thessalians. Ionic colonies founded in Asia Minor. 1068. Codrus, last king of Athens. Beginning of rule of archons.	1091. At beginning of the twenty-first dynasty two lines of kings: one at Thebes and another at Tanis. Power of Tanis established and great wall built.	1100. Tyre attains first rank among Phœnician seacoast towns.
1000		1000. Period of *HOMER*. Poems of Homer reflect the Mycenæan and Aegean period of the Greeks.	*A very complex and obscure period.* 987-952. Pasebkhanu II. King Solomon married one of his daughters. 952. Sheshanq (Shishak of the Bible), married to sister of the wife of King Solomon. Great conquests in Syria. Capture of Jerusalem.	970. King Hiram sent material for Solomon's Temple.
900		820. Legislation of LYCURGUS founded the stability of Sparta.		846. CARTHAGE founded by Elissa (Dido).
800				800. Phrygia an independent monarchy.
	I. Mythical Period of the Kings (753-510) 753-716. Romulus. 753. ROME founded. 750. Sabines incorporated with Romans.	776. FIRST OLYMPIAD, or first year the Olympian victor was recorded. 750-550. Colonizing period of the Greeks. 743-724. FIRST MESSENIAN WAR between Messenia and Sparta.	780. Rise of independent kingdom in Nubia.	
			VI. Nubian Period (722-654)	728. Midas of Phrygia foments rebellion against rule of Sargon in Northern Syria. 727. Tyre captured by Assyria. Phœnician decline begins.
	715-673. Numa Pompilius. Traditional founder of religious institutions.		722. Egypt lost Palestine to Assyria. 707. Shabako, the Nubian, gains all Egypt; incites revolt in Syria and Palestine against Sargon. Later is defeated by Sennacherib.	
700	700-200. Etruscan influence very strong.			700. Cimmerian invasion shortly destroys Phrygian Kingdom. 689. GYGES, first important King of Lydia.
	673-641. Tullus Hostilius. Alba Longa destroyed.		670-660. Assyrian supremacy. Nubians expelled by Ashur-bani-pal, but hold Thebes until 654.	

TO THE TIME OF XERXES THE GREAT, 1100-485 B. C.

point of national power. Beginning of the Medo-Persian nations. Celts disperse over western in use. Phœnician trade extended from Senegal to India. 900-800: Decline of Phœnician cities. Sargon; Babylonia rises to height of its power. 700-600: Zenith and fall of Nineveh, and Teutonic and Slav races. 600-500: Zenith and fall of Babylon. Long reign of Nebuchadnezzar; Roman republic. Establishment of democracy in Athens.

Hebrews	Babylonia-Assyria	Persians	China, Japan, India	B. C.
	VI. The Assyrian Empire.			
	1100-930. History of Babylon of little importance until 600 B. C. Assyria the great power of Western Asia till the rise of the New Babylonian Empire after the destruction of Nineveh in 607 B. C.	1100. Formation of a powerful empire in Bactria. Deeds of kings celebrated in the Shahnameh of Firdusi.	China: 1123-255. Chow dynasty. Feudal system developed.	**1100**
1040. SAMUEL, last of the "Judges."				
III. Period of Monarchy 1020. SAUL, king. Jerusalem, the capital of all Israel.				
1000. DAVID, king.		1000. Period of *ZOROASTER* and Zoroastrianism, was chief of the Magi, a priestly tribe of Media.		**1000**
977-937. SOLOMON, king. Began building the temple about 973. Married a daughter of King Pasebkhanu II. of Egypt.	930-640. *Brilliant epoch of Assyria. A period of conquest, expansion, architecture, sculpture and literary activity.*			
IV. Divided Monarchy (937) Judah and Israel				**900**
	886-858. Ashur-Nasir-Pal. One of the greatest Assyrian kings. Extended the empire. Moved the government to Calah (Nimrod) from Ashur. Built a great palace there.			
	858-823. Shalmaneser II. Ceaseless wars made him master of Western Asia. First contact with Israelites. Jehu, King of Israel, among those who sent tribute Built palace at Calah (Nimrod). Protectorate over Babylon.			
	810-781. Ramari-nirrari IV. captured Damascus. Married Babylonian princess Semiramis.	**I. Ancient Persian Period** (836-640)	India: 800. Bramanic period of Vedic literature. China: 780-700. Constant struggles between central power and feudal states.	**800**
	745-727. Tiglath-Pileser II. (identical with the king Pul of the Bible) made Babylonia subject to Assyria.	740. Western Iran (Media and Persia) subject to Assyria.		
735-715. Ahaz became tributary to Assyria. ISAIAH denounced the alliance.	728. END OF OLD BABYLONIAN EMPIRE.			
	727-722. Shalmaneser IV. suppressed the revolt of the Phœnician cities and the Kingdom of Israel.			
715-686. Hezekiah. Began religious and social reforms.	722-705. SARGON II. conquered Samaria and destroyed the Kingdom of Israel. He received tribute from Arabia, Egypt, and Cyprus; suppressed revolts in Armenia, Media and Babylonia, and united the latter with Assyria.			
	705. SENNACHERIB. Invaded Judah. Palace at Nineveh and library. Assyrian art most flourishing from Ninth to end of Seventh Century.	700-600. Scythians sweep over Media, Persia and Assyria.		**700**
681. ESARHADDON. Wars with Phœnicia, Cilicia, Edom, Medes, and Arabs. Conquest of Lower Egypt.				
	668. ASHUR-BANI-PAL (Sardanapalus). Expelled Nubians from Egypt and established his supremacy for a time. Best period of art. Creation tablets and Deluge tablets. Gyges, King of Lydia, killed during a revolt.	**II. Period of the Median Empire** 655-633. Phraortes united Media.		

III. FROM THE DEVELOPMENT OF THE ASSYRIAN EMPIRE

B. C.	Rome	Greeks	Egypt	Phœnicia-Lydia Phrygia
	641-616. Ancus Marcius. Capture of Ostia. War with Latins.	645-628. SECOND MESSENIAN WAR. Sparta victorious.	653-610. PSAMETIK I. re-united Egypt. In alliance with Gyges, King of Lydia, made Egypt independent of Assyria. Built a magnificent palace at Sais, the new capital. *Revival of art, religion and literature.*	636. Last Assyrian governor of Phœnicia.
	616-578. Tarquinius Priscus. Treaty with Latins. Temple of Jupiter on the capitol. *Important advance in power and civilization*	625. Corinth at its zenith. PERIANDER, tyrant. 621. LAWS OF DRACO at Athens.	610-595. NEKU II. Invades Syria, but is vanquished at Carchemish by Nebuchadnezzar II. of Babylonia.	610. Alyattes, King of Lydia, battles with Cyaxares of Media. Erected magnificent buildings at Sardis.
600		600-590. FIRST SACRED WAR. 594. SOLON, archon of Athens. *Laws and reforms.*		
	578-534. Servius Tullius. Rome consolidated. Rise of patricians and plebians.	560-527. PISISTRATUS, tyrant of Athens. Ionia and Greek cities of Asia conquered by Cyrus of Persia.	570-526. AAHMES II. Encouraged Greek settlement. Magnificent buildings at Naucratis and Sais.	586-573. Tyre besieged by Nebuchadnezzar. Phœnicia a Persian province (538). 568. CRŒSUS, son of Alyattes, subdued all the Grecian cities of the coast.
	534-510. Tarquinius Superbus. End of the Kings. Rome a Republic with two Consuls.	**The Rise of Athens.**	525. Psametik III. defeated by Cambyses at Pelusium. Egypt a Persian province. 520. Capture of Thebes (Luxor), and transplantation of 6000 Egyptians to Susiana.	546. SARDIS CAPTURED and Lydia absorbed into Persian Empire. 538. Phœnicia became a Persian province. 530. CARTHAGE becomes independent.
	II. The Republic to the Beginning of the Punic Wars (510-264) Struggle between patricians and plebians and development of Roman consolidation.	510. Athenian democracy fully established.	The Persian kings exact a large tribute. The fisheries of Lake Mœris, etc.	Phœnicia: through its influence the whole country is allowed to carry on its trade as usual, under the authority and protection of the king of Persia.
500	508. First commercial treaty with Carthage.	**III. Persian Wars** (500-449) See under Persia.		508. Carthage makes its first commercial treaty with Rome. 500. Carthage trades with the Greeks.
	498. First Dictator. First struggle, on account of the oppression of the debtors. 493. Tribunes of the people. 491. Comitia Tributa, in which the people have the preponderance.	490. **Marathon.** The Athenians under Miltiades defeated the Persians under Datis. Free government and Greek civilization saved. *Athens mistress of the sea.*		Carthage effects an alliance with the Persians against Sicily.
	Second struggle, respecting the division of lands. 486. First Agrarian law. Continual wars against the neighboring states.	489. Miltiades attacks Poros and fails. His condemnation and death follow. 485. Gelo, master of Syracuse.	486. Revolts, but is again subdued by Xerxes. The tribute increased.	

TO THE TIME OF XERXES THE GREAT, 1100-485 B. C.—Continued

Hebrews	Babylonia-Assyria	Persians	China, Japan, India	B. C.
			Japan: 660-585. Jimmu Tenno, first Mikado Largely legendary.	
		640. Medes revolt from Assyria and establish the Median Empire (640-558.)		
	626. Assyrian power declining at death of Ashur-banipal. NABOPOLASSOR, Assyrian governor of Babylon, makes the latter independent, and wars against Assyria.	633-593. CYAXERES, with Nabopolassor of Babylonia, capture Nineveh and destroy the Assyrian Empire.		
	610. Fall of Nineveh. END OF ASSYRIAN EMPIRE, divided among Medes and Babylonians.			
608-597. Jehoiakim. JEREMIAH.	608. **New Babylonian Empire.** 604-651. NEBUCHADNEZZAR II. makes Babylonia the leading nation of the East. Conquered Jerusalem (586) and subdued Tyre (585). *Splendid architectural era at Babylon.*			**600**
586. CAPTURE OF JERUSALEM by Nebuchadnezzar, temple destroyed and Jews made captive.		593-558. Astyoges, last King of Medes. Cyrus revolted, deposed the king, became king of Persia and master of the East.		
		II. Period of the Persian Empire (558-330) 558-529. CYRUS, emperor. Conquered Crœsus, King of Lydia.		
	555. NABONIDUS, father of the Biblical Belshazzar, great builder and restorer of temples.		China: 551. *CONFUCIUS* born. Greatest figure in Chinese history.	
538-332. Palestine under Persian dominion.	539-538. War of Cyrus against the Babylonians. Babylon captured. The Babylonian Empire incorporated with the Persian.			
	529-522. CAMBYSES conquered Egypt by his victory at Pelusium.			
520-516. Temple rebuilt at Jerusalem.	521-485. DARIUS son of Hystaspes was made king. *Darius has special interest because he was first to extend Persian authority into Europe, and thus paved the way for the subsequent invasion of Greece.* 518. Revolt of Babylon, and destruction of that city after a twenty months' siege. Indian campaign, in which the countries north of the Indus become subject to Persia. Indus the boundary of the empire. 513. (?). Unsuccessful expedition of Darius against the Scythians with a land force of 700,000 men. Macedonia and Thrace tributary.		This great Chinese philosopher, introduces a new religion, opposed to that of Fohi, and boldly inveighs against the vice and immorality of the times.	**500**
	500-494. The Ionian colonies rebel, and are assisted by the Athenians, which gives rise to the Perso-Grecian wars and the national hatred between the two countries. 499. Sardis burnt by the Ionians. **Grecian wars** follow.			
According to Philo, the history of Judith and Holofernes falls under the reign of Artaxerxes.	494. The Greeks and their allies defeated in naval engagement at the island of Lade.			
	493-490. War of Darius against the European Greeks. Revolt among the Egyptians. 492. First expedition, under Mardonius, unsuccessful.			
Under the same king lived Esther and Haman.	490. Second expedition, defeated at Marathon by Miltiades.			
	486. Egypt revolts and is not reduced to subjection until 484.			
	485. Death of Darius. He was succeeded by his son XERXES.			

IV. FROM THE ACCESSION OF XERXES THE GREAT TO

GREAT EVENTS OF THE PERIOD. 500-400: Zenith of Persia; and glorious century of Greece. Alexander the Great; Greek language and Greek civilization extended all through the Levant. Greek Kingdoms built on the ruins of the Persian Empire; in Egypt the Ptolemies; in Syria,

B. C.	Carthage	Rome	The Greeks
	Carthage became independent of Phœnicia in 530.	481-475. Wars with Veii.	*ÆSCHYLUS* (525-456) 481-480. Third expedition of the Persians against Greece under Xerxes.
475	480. Carthaginians invaded Sicily; defeated at Himera by Gela.		480. Battle of the Greeks under Leonidas, at Thermopylæ. Naval battle of Salamis saved Athens.
		471. First Publilian Laws.	479. Fourth expedition of the Persians against Greece. Greek victories at Platæa and Mycale. Persian army destroyed *SOPHOCLES* (495-406). 465. Battle of the Eurymedon. 464-456. THIRD MESSENIAN WAR.
		451-449. The Decemvirate.	457-445. War of the Spartans and Bœotians against Athens.
450		450. The Twelve Tables. 448. Valerian and Horatian Laws. 445. Canuleian Laws.	449. Battle of Salamis in Cyprus. *HERODOTUS* (484-408). *EURIPIDES* (480-406). 445. End of Persian war. Thirty years' peace between Athens and Sparta. **IV. Age of Pericles and Greek Luxury** *PERICLES* (499-429).
425		444. Consular Tribunes.	444-429. Athens under the administration of Pericles, reached the zenith of its greatness. *PHIDIAS* (fl. 448-440). 431-404. PELOPONNESIAN WAR—between Athens and Sparta. *SOCRATES* (469-399) 421. ALCIBIADES in power at Athens. *THUCYDIDES* (471-402). 415-413. Expedition of the Athenians against **Syracuse.** Greek defeat. Decline of Athenian power.
	410. HANNIBAL and Hamilcar invade Sicily. 405. Treaty between Carthage and Syracuse. Landed aristocracy created at Carthage.		405. LYSANDER of Sparta destroyed Athenian fleet. **The Spartan Supremacy** (405-371). 404. Surrender of Athens and end of Peloponesian War. Sparta supreme in Greece.
400			399-394. War between the Spartans and Persians. Fall of Spartan power in Asia. *PLATO* (429-347).
		390. GAUL'S INVASION OF ITALY. Rome burned. 377-367. Licinian Laws.	379-362. War between Thebes and Sparta. Thebes freed.
375		366. First Plebeian Consul.	
			359. Rise of the Macedonian power. PHILIP OF MACEDON. *DEMOSTHENES* (382-347). 357-355. The Social War.
350	360. Carthaginians form settlements in Spain. 343. Greek cities of Sicily freed from Carthage.	348. Treaty of commerce with Carthage. 343-341. FIRST SAMNITE WAR. 340-338. Great Latin War.	355-346. Second Sacred War against the Phocians, who seized Delphi. *ARISTOTLE* (384-322.) **V. The Macedonian Period** (338-146) 339-338. THIRD SACRED WAR. Macedonians against Athens and Thebes. 338. Macedonia supreme under PHILIP II. 336. Philip assassinated. 336-323. ALEXANDER THE GREAT, King of Macedonia. Great extension of power. 334-328. WARS OF ALEXANDER IN ASIA. 334. Battle at Granicus. 333. Founded Alexandria in Egypt. Occupied Babylon, subdued Persia and Darius III. Invaded India in 327.

THE PERIOD OF THE PUNIC WARS, 485-264, B. C.

Struggles of Patricians and Plebeians at Rome. 400-300: Decline and fall of Persia before Roman wars with the Samnites. Internal quarrels of the Romans diminish. 300-200: Semi-the Antiochi. Many Jews at Alexandria.

Egypt	Hebrews	Persia	China-Japan-India	B. C.
485. Xerxes quelled a revolt.		485-465. XERXES I.		
		480. Xerxes invaded Greece, Thermopylæ, Salamis. Elaborate great palace at Persepolis. Hypostyle Hall, fine bull-capitals, good bas-reliefs with invocations to Ahura Mazda. Propylæa, winged human-headed bulls. Hanging draperies. Xerxes and his eldest son murdered.		475
		479. Persians expelled from Greece.	478. China: Death of Confucius. China distracted by internal wars.	
		465-424. Artaxerxes I. succeeded to the throne.		
	458(?). Ezra.	462-455. Second revolt of the Egyptians.		
455(?). Herodotus in Egypt.				
			450. India: Brick and stone buildings in existence.	450
	444. NEHEMIAH, governor of Jerusalem. Rebuilds the city walls.	424. Xerxes II. murdered by his brother Sogdianus same year.		425
		423. Darius II.		
	415. Death of Nehemiah. High priests rule under Persian authority.	412. Sparta recognized Persian rule in Asi Minor.		
		405. Egypt declared its independence.		
404. Egypt independent of Persia for short period.		404. ARTAXERXES II. Revolt of his younger brother Cyrus, aided by Greeks. 401. Cyrus defeated at Cunaxa and slain. "Retreat of the Ten Thousand."		400
		398. Artaxerxes II. War with Greece. Egypt and Cyprus assisted Greece. 394. Persian fleet defeated the Spartans at Cnidus.		
			372. China: MENCIUS born.	375
	370. Persian satrap suppressed civil war.	370-363. Renewed revolts in Asia Minor. Egypt joined the rebels and invaded Syria.		
361. Treaty with Sparta vs. Persians. 359-342. Persian invasions of Egypt. Nectanebo II. last native king.		358. Artaxerxes III. seized the throne. Persians defeated in Egypt.		
	350. Temple destroyed by Persians. Many Jews deported.			350
		340. CONQUEST OF EGYPT.		
		337. MITHRIDATES I. of Pontus became independent of Persia.		
		335. Darius III. ascended the throne. 334-332. Alexander the Great defeated Darius at Granicus and Issus.		
334-323. Alexander the Great overthrows Persians, and is master of Egypt. Greek domination. Alexandria founded. EUCLID (Alexandria), (fl. 325).	333. Palestine under Alexander the Great. Remained under Greek domination to 198 B. C.	331. Battle of **Arbela.** The Persians defeated by the Macedonians and Greeks under Alexander the Great. END OF THE PERSIAN EMPIRE.	326. India: Alexander's invasion.	

IV. FROM THE ACCESSION OF XERXES THE GREAT TO

B. C.	Carthage	Rome	The Immense Greek Empire
325	*Carthage rises in wealth and political importance.*	326-304. SECOND SAMNITE WAR.	323. Death of Alexander at Babylon. His empire split up brother and his posthumous son. Antipater and Çraterus Antigonus, Pamphylia, Phrygia and Lycia; Eumenes, Alex- the Hellespont. 323-301. WARS OF ALEXANDER'S SUCCESSORS FOR HIS ASIATIC before peace was concluded between the contending claimants. *KINGDOMS AND STATES which arose upon the DIVISION*
			Macedonia / **Greece** / **Thrace**
			323. Perdiccas appointed regent: slain 321. / 323-322. Lamian War; Phocian at head of affairs. Death of Demosthenes. / 323. LYSIMACHUS is appointed governor of Thrace.
		321. The Samnites defeat the Romans at the Caudine Forks and send them under the yoke.	321. Antipater, regent of the empire.
	317. Carthage and Syracuse at war.		319. Polysperchon succeeds Antipater, and proclaims liberty to the Grecian cities. / 317. Phocion put to death by the Athenians. Demetrius Phalereus governs Athens.
			315. Cassander rebuilds Thebes.
	310. Agathocles invades Carthaginian territory in Africa.		
		309. Fabius Maximus defeats the Etrurians at the Vadimonian Lake.	
		307. The Carthaginians defeat Agathocles and besiege Syracuse.	307. Lysimachus seizes the throne.
	306. Peace with Syracuse.		303. Demetrius Poliorcetes, general of the Grecia states, opposes Cassander.
			302. CASSANDER, king of Macedonia. / 302. Invades Asia.
			301. AFTER THE BATTLE OF IPSUS ALEXANDER'S
			Macedonia / **Greek States**
300		298-290. THIRD SAMNITE WAR. *These wars pave the way to the subjugation of Italy, and the future greatness of Rome.*	296. Death of Cassander. Quarrels of his two sons, Antipater and Alexander.
		286. LAW OF HORTENSIUS, by which the decrees of the Plebs are made absolute in the state. The end of the long struggle between Patricians and Plebeians.	287. Demetrius expelled by Pyrrhus. Lysimachus drives Pyrrhus out of Macedonia. / 287. Athens revolts from Demetrius.
			283. Death of Demetrius.
		282-272. ROMAN WAR WITH TARENTUM. Tarentum seeks the aid of PYRRHUS, king of Epirus.	281. Lysimachus defeated and slain by Seleucus. / 281. The ACHÆAN LEAGUE created.
		278. Pyrrhus lands in Sicily, and makes himself master of all the Carthaginian towns.	280. Sosthenes ascends the throne and liberates his country; but falls, 278. Lysimachus defeated and slain by Seleucus in the battle of Korupedion.
275			277. ANTIGONUS GONATAS, King of Macedonia, descendant of one of Alexander's generals, master of all Greece except Sparta. / 274. Pyrrhus invades Macedon, defeats Antigonas, and is proclaimed king.
			272. Pyrrhus besieges Sparta and Argos—is slain, and Antigonus is restored.
		266. Roman subjugation of Italy is completed.	266. The Chremonidean War. Athens and Sparta allied in revolt against Macedonia.
	264-241. FIRST PUNIC WAR. Contest over Sicily.		

THE PERIOD OF THE PUNIC WARS, 485-264, B. C.—Continued

of Alexander The Great				China-Japan-India	B. C.
among his generals after his death. Perdiccas became regent in Asia for Alexander's half shared the regency of the west. The other generals received lieutenancies: Ptolemæus, Egypt; ander's secretary, Paphlygonia and Cappadocia; and Cassander, Caria; Leonnatus, Phrygia on				325-315. India. MAURYA DYNASTY, most brilliant of old Hindu dynasties.	325
DOMINIONS. The first partition of the empire was made 322, but twenty-two years elapsed					
OF THE MACEDONIAN EMPIRE AT THE DEATH OF ALEXANDER THE GREAT.					
Egypt	**Palestine**	**Phrygia, Lycia Pamphylia**	**Syria**		
323. Ptolemy I. Soter, the son of Lagus.	323. Annexed with Phœnicia to Syria.				
320. Ptolemy makes himself master of Cyprus and Syria.		320. Phrygia, Lycia, Pamphylia fell to the share of Antigonus, who defeats Eumenes and makes himself master of all Asia Minor.	321. The Kingdom of the Seleucidæ founded by SELEUCUS NICATOR, who received Babylon as his province.		
	312. Capture of Jerusalem by Ptolemy. Colony of Jews in Alexandria.	315. Formation of a league against Antigonus by Ptolemy, Cassander, Seleucus, and Lysimachus.	312. Syria ruled by Seleucus Nicator; he takes Babylon. Era of the Seuleucidæ.	312-306. India: Seleucus attempts to recover provinces of Alexander.	
	311-301. Subject to Antigonus.				
305. Ptolemy assumes the regal title of Egypt.					
Alexandria begins a great period.	301. Again under Egypt.	301. Battle of Ipsus. Antigonus killed.	301. After the battle of Ipsus, Seleucus gains the provinces of Syria, Cappadocia, Mesopotamia, and Armenia.		
EMPIRE WAS AGAIN DIVIDED INTO FOUR CHIEF PARTS.					
Egypt	**Palestine**	**Seleucid Kingdom**			
The empire of the Ptolemies extended over Egypt, Libya, Cyrene, Arabia Petræa, Judæa, Phœnicia, Damascus, and Cyprus. Golden age of the Ptolemies.	300. Canon of Old Testament, under Simon the Just.	299. Seleucus built or improved a great number of cities including Antioch, Seleucia, Apamea, and Laodicea.		300. India: Brahmanic system of caste instituted.	300
		287. Seleucus defeats Demetrius Poliorcetes and keeps him prisoner.			
283-247. PTOLEMY II. Philadelphus, the most magnificent of the Egyptian kings, is associated by his father in the kingdom. Canal of Arsinöe. Obelisk.	284. The *Septuagint* translation of the *Old Testament*, begun at Alexandria, by order of Ptolemy Philadelphus.				
		280. Antiochus I. succeeds Seleucus. 278-250. Nicomedes I.			
		277. Gauls (Galatia) invaded Asia Minor.			275
273. Ambassadors sent to Rome. 272. Roman embassy sent to Egypt.				270. India: ASOKA decendant of Chandragupta, reigns in Magadha; he is a friend of Buddhism.	

V. FROM THE BEGINNING OF THE PUNIC OR CARTHAGINIAN

GREAT EVENTS OF PERIOD. 300-200: Rome mistress of Italy; then, victorious over Car- Italy. 200-100: Greece, Macedonia, Carthage, and Spain under Roman rule; decline of the Eastern luxury introduced among the Romans. 100-1: The Romans govern all the countries

B. C.	Carthage	Rome	Macedonia	Greek States
		III. Epoch of the Punic Wars, and Beginning of the Universal Rule of Rome (264-146)		
	264-241. FIRST PUNIC WAR. Carthaginians led by Hamilcar, father of Hannibal.		262. Antigonus took Athens. End of its independence and political importance.	
		260. First Roman fleet built. Victory at sea. SCIPIO AFRICANUS. *ARCHIMEDES* (287-212).		
250	256. Regulus invades Africa, and is defeated by Xanthippus, a Spartan general.			255. Antigonus liberates Athens. Athens joins the Achæan League.
	241. Peace with Carthage. The ceded parts of Sicily formed the first Roman province there.			
	238. HAMILCAR begins establishment of Carthaginian power in Spain.	241. The Roman fleet under Catulus defeats the Carthaginians off the Ægatian Islands.	227. War between Cleomenes, King of Sparta, and the Ætolian league.	
225	HANNIBAL (247-183)		226. Athens freed from Macedonia allied with Rome.	
		224. The Romans first cross the Po.		
	221. Hannibal succeeds Asdrubal in the command.	219. Hannibal takes Saguntum and crosses the Alps.		
	218-201. SECOND PUNIC WAR. Hannibal crossed the Alps.			
		217. Romans defeated at Lake Trasimene.		
		216. Romans at Cannæ totally defeated by Hannibal. Fabius Maximus, Dictator.		
		215. Treaty between Hannibal and Philip V. of Macedonia.		
		214-205. FIRST WAR WITH MACEDONIA.		
		212. Syracuse taken by Marcellus. Archimedes killed.		
		211. Capua taken by the Romans.		
		209. Publius Scipio takes New Carthage.	211. Alliance of Rome the Ætolians, Spartans, Eleans and Illyria.	211. The Ætolians secure the alliance of Rome against the Achæans and the Macedonians.
		207. Nero and Livy defeat Hasdrubal at the **Metaurus**—Hasdrubal killed. Here it was decided that the civilization of the world was to be Roman rather than Carthaginian.		207. Battle of Mantinea: Philopœmen, the general of the Achæan League, defeats the Spartans.
		206. The Carthaginians defeated in the battle of Ilipa and driven out of Spain.		
	204. Scipio carries the war into Africa.		204. General peace.	
200	202. Flight of Hannibal. Carthage conquered. Battle of Zama. End of Punic War.		203. Philip wages war against Attalus and the Rhodians.	
			200-197. SECOND MACEDONIAN WAR.	198. The Achæans and Spartans join the Romans against Macedonia.
			197. Philip V. defeated at Cynoscephalæ by the Romans under Flamininus.	
	196. Hannibal joins Antiochus, whom he urges to carry on war against the Romans.	195. Cato in Spain.	196. Macedonian Greece declared free by the Romans.	
	193. Masinissa, King of Numidia, harasses the Carthaginians, and injure their commerce.	192-190. War with Antiochus of Syria, who is totally defeated at Magnesia by Scipio Asiaticus.		

WARS TO THE FOUNDING OF THE ROMAN EMPIRE, 264-30, B. C.

thage, extends her influence to Greece and Spain. Peasant proprietors replaced by slaves in Roman Oligarchy; the Gracchi begin the democratic revolution which ends in the empire. around the Mediterranean. Roman Oligarchy is followed by establishment of the empire.

Seleucid Empire	Palestine	Egypt	Parthia	China, India, Japan	B. C.
261. Revolt of Parthians from Seleucid rule. Parthian kingdom formed.	The Jews remained subject to Egypt down to B. C. 203, in comparative peace.	247-30. Ptolemy III., Euergetes. Extended his empire by conquests in Mesopotamia, Babylonia, Persia, Susiana, and Media, and extends his influence as far as Thrace and Macedonia.	250-248. Arsaces I. founds the kingdom of Parthia, having killed Agathocles, and expelled the Macedonians.		250
223. ANTIOCHUS III., the Great ruled Syria, Phœnicia to Egypt.				221-210. China: Chi-Huang-Ti, first universal emperor. GREAT WALL BUILT.	225
217. Antiochus III. defeated by Ptolemy Philopater in the battle of Raphia.			216. Arsaces III. King of Parthia.		
212-206. Campaigns in Upper Asia against the Parthians and Bactrians.		205. Ptolemy V., Epiphanes. Lost most of the cities of Palestine and Phœnicia to Antiochus, and the cities of the Hellespont to Philip V. of Macedon. Egypt assisted by Rome.		206. China: The dynasty of Han founded; it lasts until 221 A. D. *One of the most brilliant periods in the history of China.*	
	203. Judæa submits to Antiochus the Great.	*Roman influence prevails from this time.*			
198. Antiochus defeats the Egyptians under Scopas in a great battle in Palestine.	198. The Jews assist Antiochus in expelling Scopas and the Egyptian troops from Jerusalem; final establishment of the Syrian power in Palestine.			199-138. India: So-called "Greek Kings."	200
195. Hannibal flees to Antiochus III.			196. Arsaces IV., King of Parthia.		
192. Syria at war with Rome.		193. Ptolemy marries the daughter of Antiochus the Great.			
190. Scipio Asiaticus defeats Antiochus III., at Magnesia and compels him to cede all of Asia Minor excepting Cilicia.					

V. FROM THE BEGINNING OF THE PUNIC OR CARTHAGINIAN WARS

B. C.	Carthage	Rome	Macedonia	Greek States
	The dangers which threaten Carthage are much increased by the rising jealousy of Rome, the daring hostilities of Masinissa, and the factious spirit of her own citizens.	*Rome the Arbitress of Nations, from the Atlantic to the Euphrates.*	181. Demetrius is put to death by his father. 179. Death of Philip.	189. The Ætolian League crushed by the Romans. 188. Philopœmen abrogates the laws of Lycurgus in Sparta. 183. Philopœmen is taken prisoner and put to death by the Messenians. *Decline of the Achæan League.*
175		177. Istria subdued. 171-168. THIRD MACEDONIAN WAR. 168. Decisive battle of **Pydna**, and overthrow of the kingdom of Macedon. *The Romans aspire to universal empire. Increased patronage of literature and the arts. Grecian system of education adopted at Rome.*		172. The Romans effect the dissolution of the Bœotian confederacy.
150	152. Masinissa's party expelled from Carthage, which leads to a war. Masinissa defeats the Carthaginians. *Carthage at this time contained 700,000 inhabitants.*	155-150. SPANISH WAR. The Roman arms unsuccessful in Spain.		155. Embassy of Diogenes, Carniades, and Critolaus to Rome. 150. Dissensions between the Spartans and Achæans.
	149-146. THIRD PUNIC WAR. 146. P. Scipio Æmilianus takes and destroys Carthage. *A Roman province.*	149-8. FOURTH MACEDONIAN WAR. *Cato's continual harangue "Delenda est Carthago."*	148. Macedon reduced to a *Roman province.*	146. Fall of Corinth *Roman province of Achæa.*

IV. Epoch of the Civil Wars

Down to the Absolute Rule of Octavian, After the Battle of Actium.

	Affairs in the West	Affairs and Civil Wars in Rome	Affairs in the East
	146-140. War with Viriathus, the gallant leader of the Lusitani, who maintains a six years' war with Rome. 145. Æmilianus is sent against Viriathus. 143-133. NUMANTINE WAR of ten years. 140. Viriathus is treacherously murdered, and Lusitania becomes a Roman province.	A struggle arises between the aristocracy (the nobiles and optimates, or rich families of senators and magistrates) and the plebs, or common people.	
	128. Flaccus reduces the Transalpine Ligurians. *Increase of Roman power in Transalpine Gaul.*	133-121. CIVIL TROUBLES UNDER THE GRACCHI. 130. The Tribunes obtain a seat and the right of voting in the senate.	133. Pergamus bequeathed to Rome by Attalus III.
125		123. Tribunate of CAIUS GRACCHUS. Renewal of the Agrarian Law.	
	122. Aix, the first Roman colony in Gaul. *Gaul a Roman province.*	121. General struggle in the city, C. Gracchus and 3000 citizens killed. *Triumph of the aristocracy.*	118. Death of Micipsa, King of Numidia, and assassination of Hiempsal by Jugurtha.

TO THE FOUNDING OF THE ROMAN EMPIRE, 264-30, B. C.—Continued

Seleucid Empire	Palestine	Egypt	Parthia	China, India, Japan	B. C.
189. ARMENIA revolts from the Seleucid rule and establishes its independence.					
187. Antiochus III. killed; succeeded by Seleucus IV. Philopator.		187. Ptolemy renews his alliance with the Achæans.			
		181-146. Ptolemy VI. (Philometor).	181-174. Arsaces V., conquers the Mardians on the Caspian.		
					175
175-164. Antiochus IV. Epiphanes. Universally hated and despised.	175. Deposition of the high priest Onias.		174-136. Mithridates I., raises Parthia to an exalted rank.		
171. Invades Egypt, and gains a victory at Pelusium.		171-168. War with Antiochus Epiphanes.			
170. Another victory. Subjugation of Egypt as far as Alexandria.	170. Tyrany of Antiochus.				
	167. Revolt of Mattathias, which proves remarkably successful.				
	166-161. Judas Maccabæus.			166. China: Tartar invasion.	
164. Dies on his way to Babylon. Loss of Babylonia, Persia, and all the countries between the Euphrates and Indus.		164. Partition of the kingdom. Physcon receives Cyrene and Libya.			
161-150. Demetrius I. Soter.	161-142. Jonathan joins the party of Alexander Bala, and becomes the leading man in Judæa.				
153-152. Alexander Bala. Occupies Ptolemais.	*Continued struggle of the Jews, in defence of their civil and religious rights to 130.*				
150. Demetrius killed in battle.					150
150-125. Demetrius II. Nicator. regains his father's kingdom by the aid of Ptolemy Philometor.					
		146-117. Ptolemy VII. (Euergetes II.), a cruel and odious tyrant.			
137-128. Antiochus VI. Sidetes, marries Cleopatra.		143. Embassy of Scipio Africanus to Alexandria.	138. The invasion of Demetrius II. of Syria.		
129. War with Parthia, in which Antiochus is slain, 126.				140. China: Vou-ti, Emperor, Great Ruler, invasion of Huns.	
The succeeding history of the Seleucidæ is a horrid picture of civil wars, family feuds, and deeds of violence.	130. John Hyrcanus, aided by the Parthians, asserts his entire independence.	130. The Alexandrines rebel. The king flees to Cyprus.	128. Invasion of Antiochus. Parthian empire is henceforward freed from the attacks of the Syrian kings.		125
		117-81. Ptolemy VIII. (Soter II.)	124-87. Mithridates II., restores tranquillity to the East after a long succession of bloody wars.		
111. Conclusion of war by a partition of territory. Syria and Phœnicia are the only provinces that acknowledge the sway of the king of Syria.	110. Hyrcanus joins the Sadducees. 106. ALEXANDER JANNÆUS.	Cleopatra and her younger son, Alexander, jointly reign in Egypt.	He meets with a powerful rival in Tigranes I. King of Armenia.		

V. FROM THE BEGINNING OF THE PUNIC OR CARTHAGINIAN WARS

B. C.	Rome Affairs in the West	Affairs and Civil Wars in Rome	Rome Affairs in the East
	113-101. Cimbrian War. The Cimbrians and Teutones migrate along the Danube to the boundaries of Illyria.		111-106. JUGURTHINE WAR. Mummius and Metellus take part in it; and Marius ends it by the capture of Jugurtha, 106.
100			96. Cyrene bequeathed to the Romans by Apion.
	91-88. Marsian or Social War, which costs the lives of 300,000 men; and ends in the concession of the rights and privileges of Roman citizenship to the Italian states.		92. Sulla settles the affairs of Asia Minor.
	83-72. Sertorius, the opponent of Sulla, goes into Spain, becomes general of the Lusitani.	88-82. FIRST ROMAN CIVIL WAR OF MARIUS AND SULLA. Sulla obtains the command against Mithridates. Marius by an alliance with Sulpicius and the people. Sulla is created perpetual dictator. *CICERO* (106-43).	88-63. Wars with Mithridates the Great, King of Pontus.
	78. War with Rome.	79-78. Abdication and death of Sulla. *Rising splendor of Rome. Marble theater of Saurus for 80,000 spectators. Magnificent houses of the Roman nobles. Library of Lucullus.*	74. Bithynia bequeathed to Rome by King Nicomedes III.
	72. The Helvetii and other tribes, under Ariovistus, advance into Gaul, but are defeated by JULIUS CÆSAR, 58.	73-71. WAR WITH SPARTACUS the gladiator, at the head of 70,000 slaves in Italy. Concluded by Crassus and Pompey. 65-62. Catiline's conspiracy suppressed by the vigilance of Cicero. 60. First Triumvirate: Cæsar, Pompey and Crassus.	66. Pompey in Asia, about the Caucasus, 65, in Syria, 64. Settles the affairs of Asia, 63.
	58-51. GALLIC WAR. Cæsar's eight campaigns in Gaul—he arrests the invasion of the Helvetii and expels the Germans. 55. First invasion of Britain, and expedition into Germany. 54. Second invasion of Britain. 54-53. Cæsar crosses the Rhine, but is unsuccessful in his attack upon the Germans.		54-53. Parthian War, in which Crassus is slain.
50			
	49-31. SECOND ROMAN CIVIL WAR between Cæsar and Pompey: Cæsar crosses the Rubicon with 6,000 men, and in sixty days makes himself master of Italy. Cæsar marches into Spain, and forces Pompey's troops to surrender.		
		48. Cæsar gains the decisive victory of **Pharsalia** over Pompey, who flees into Egypt and is there slain. *VIRGIL* (70-19). 47. Cæsar in Asia. War with Pharnaces, King of Bosporus, ("veni, vidi, vici.") 46. African War: defeat of Scipio and Juba at Thapsus. Cæsar returns to Rome. Dictator for ten years.	Cato kills himself at Utica.
	45. War in Spain; defeat of Pompey's two sons at Munda — Cæsar returns to Rome—Perpetual dictator, and Consul for ten years.		
		44. Plans an expedition against the Parthians, but is assassinated in the senate house by Brutus, Cassius, and other conspirators, on the ides of March. Antony and Octavianus (Cæsar's heir) obtain the upper hand in Rome. Second Triumvirate: Antony, Octavianus, and Lepidus. 42. Civil war of the triumvirate against the republicans—Philippi—death of Brutus and Cassius. 41-30. Quarrels of the Oligarchy.	
		36. Defeat and death of Pompey.	36. Marcus Antonius invades Parthia but is compelled to retreat with loss.
			34. Anthony subdues Armenia.
		33-30. Civil war between Octavianus and Antony. 31. Defeat of Antony at Actium. Cæsar gains his fleet and army—death of Antony. Octavianus Cæsar sole master of the republic.	
	30. PERIOD OF THE ROMAN EMPIRE BEGINS. HISTORY OF THE EMPIRE IS NOW PRACTICALLY AND ORIENTAL PROVINCES.		

TO THE FOUNDING OF THE ROMAN EMPIRE, 264-30, B. C.—Continued

Seleucid Empire	Palestine	Egypt	Parthia	China, India, Japan	B. C.
SYRIA					
	98-97. Jannæus besieges and takes Gaza.				100
			92. First public transactions between *Rome and Parthia.*	97-30. Japan: Sujin, Mikado. Important reforms.	
83. Tigranes, King of Armenia, is invited by the Syrians to assume the crown.		82. Revolt and three years' siege of Thebes, which is captured and destroyed.			
69. He is expelled by Lucullus.			68-60. Arsaces XII. contemporary with the third Mithridatic War.		
65-62. Antiochus Asiaticus is expelled by Pompey, who reduces Syria to a Roman province.	63. Judæa dependent upon Romans.	This period of Egyptian history is very obscure.			
By the absorption of Syria, Rome comes into touch with the Parthian power.					
	54. Crassus pillages the Temple.		54. First war with Rome caused by the invasion of Crassus.		
52. Parthians overrun Syria and threaten Antioch.			52-51. The Parthians invade Syria.		50
	48. Antipater, by the influence of Julius Cæsar, he is appointed procurator of Judæa.	48. ALEXANDRINE WAR. Ptolemy perishes in the contest, and the crown falls to CLEOPATRA, who reigns jointly with Ptolemy II.			
		44. Cleopatra removes her brother by poison.			
40. Parthians invade Syria, take Antioch and Sidon, plunder Jerusalem, and advance as far as the Mediterranean.	38. Herod, his second son, rises to power by the friendship of Antony and is appointed king.		38. Arsaces XV.	40. India: Trade with Greece, Rome, Egypt, China, and the East. Period of Hindu power.	
	37. He takes possession of Jerusalem and Judæa.	36. Cleopatra obtains from Antony grant of Phœnicia, Cyrene and Cyprus.	36. Defeats Antony.		
		30. Dies by her own hand. *A Roman province.*			
THAT OF THE CIVILIZED WORLD, DIVIDED INTO LATIN, GREEK					

VI. FROM THE BEGINNING OF THE ROMAN EMPIRE UNDER

GREAT EVENTS OF THE PERIOD: Rome mistress of the world. The Augustan Age. Golden
erful state but unequal rival of Rome. 100-200: Zenith of Roman Empire. The good emperors.
tribes on Roman borders. Persecutions continue. 300-400: Constantine moves the capital
Great church disputes. Germanic incursions and settlements. The Roman Empire reaches

B. C.	The Roman Empire—In Europe, Asia and Africa—Under Augustus Cæsar, Emperor	
	31-14. Cæsar Octavianus Augustus. The surname Augustus (the Illustrious, the Sublime), which was given Octavianus by the Senate in 27 B. C., is the name by which he was known as sole ruler of the Roman world.	
	Countries Subject to Roman Dominion	**Age of Augustus**
	IN EUROPE:—*Spain, Gaul, Britain, Italy, Rhætia, Vindelicia, Noricum, Pannonia, Illyria, Greece, Macedonia, Thrace, Mœsia, Dacia.*	27-25. Expedition of Augustus against the Cantabri and Astures.
25	IN ASIA:—*Asia Minor, Syria, Phœnicia, Palestine, the northern and eastern coasts of the Black Sea, Armenia, Mesopotamia, Assyria.*	25. Expedition to Arabia, without results, conducted by C. Ælius Gallus, prefect of Egypt. 22-21. Successful war against the Ethiopians, by Petronius, the successor of Gallus in Egypt.
	IN AFRICA:—*Egypt, and the whole of the northern coast.*	20. Campaign of Augustus against the Parthians. Tigranes was reinstated in the kingdom of Armenia.
	Its distant territories were *Scandia, Sarmatia, India, Æthiopia,* and *Galatia;* Rome itself being the common center of the whole.	19. Subjugation of Spain completed. 15. Rhætia made a Roman province, along with Vindelicia (now Augsburg) and Noricum. 12-9. Drusus undertook four campaigns in Germany proper.
1 A. D.	**German Nations**	
	6-9. Varus, in his camp on the Weser, governs Lower Germany as a Roman province.	4-6. Campaigns of Tiberius in Germany.
25	9. Hermann, or Arminius defeats Varus at **Winfeld-Lippe.** Teutonic independence established by the defeat of the Roman legions. The line drawn between the Germanic and Latin races. 14-17. Expedition of Germanicus.	7. Germanicus is sent into Germany. 14-37. Tiberius (Claudius Nero), step-son of Augustus.
	The Romans from this time maintain military power on the right bank of the Rhine and from the Maine to the Danube.	
		37-41. Caligula (properly, Gaius Cæsar Germanicus), youngest son of Germanicus. 41-54. Claudius (Tiberius Claudius Nero), son of Drusus, influenced largely by 1, the shameless Messalina; 2, the ambitious Agrippina. 43. Commencement of the conquest of Britain.
50	50. Colony of Claudius. Agrippa (Cologne) founded.	
		54-68. Nero (Nero Claudius Cæsar Augustus Germanicus). Destroys Britannicus and all the Julian family. 59-62. Murders his wife and mother. 64. Fire at Rome, followed, 65. by the persecution of the Christians.
75	69-70. Revolt of the Batavians in Belgian Gaul.	68. Death of Nero, and extinction of the house of Cæsar. 69-79. VESPASIANUS, (Titus Flavius Vespasianus), one of the best of Roman princes. Eruption of Vesuvius and destruction of Herculaneum, Pompeii and Stabiæ.
		86-107. DACIAN WARS. *PLUTARCH* (50?-120?)
100		98-117. TRAJAN (Marcus Ulpius Traianus). Excellent ruler and general. Magnificent buildings in Rome (Forum Traianum) and throughout the empire. 101-103. Victorious over the Dacians.
	106. Dacia a Roman province. The country is filled with Roman colonists. Origin of the Latin language in Hungary.	107. Reduction of part of Arabia.
		114-116. War with the Parthians, in which Rome is victorious. Armenia and Mesopotamia Roman provinces.
		PERIOD OF GREATEST EXTE
125		117-138. Hadrian (Publius Ælius Hadrianus) a lover of peace, an excellent administrator, learned and vain. 117. Gives up the provinces of Armenia, Mesopotamia and Assyria.

AUGUSTUS TO ITS PERMANENT DIVISION, B. C. 30-395, A. D.

Age of Roman literature. 1-100, A. D.: Christianity founded amid persecutions. Parthia a pow-
Persecutions of the Christians continue. 200-300: Emperors chosen by the army. Germanic
of the empire to Constantinople, and professes Christianity. Rise of Christian Monasticism.
its greatest territorial extent.

Roman Empire	Parthia	China, Japan, India	B. C.
Palestine			
30. Augustus bestows increase of territory on Herod. 29. Herod kills his wife, Mariamne.		30. Japan: Suinin, a great civilizer.	
		27. India: Andhra kingdom very powerful.	
25. Herod begins extensive building operations in Judea: rebuilds Samaria, reconstructs temple at Jerusalem, 20-19.	25. Tiridates aspires to the sovereignty, but is defeated and takes refuge at the court of Augustus.		25
	20. Phraates restores the standards taken from Crassus.		
4. Birth of **Jesus Christ.** Date now generally accepted though not actually certain.	18. Sends his sons as hostages to Rome.		
	Gradual decline of the Parthian Kingdom.		
The Christian Church			
6. Judea made a Roman province under a procurator.			1 A. D.
			25
26. Pontius Pilate becomes procurator of Judea. 28-29. Baptism of Jesus Christ and beginning of His public work. 30. Crucifixion of Jesus Christ. 35-36. ST. PAUL converted to Christianity.	*Series of struggles for succession to the throne for over one hundred years.*	21. India: Gondophares, King of Kabul and Punjab.	
42. St. Peter, the Apostle, after filling the see of Antioch seven years, goes to Rome.			
49. Council of the Apostles at Jerusalem.			
	50. Vologeses I. 52. War against Rome for the possession of Armenia Minor.		50
56. Paul arrested in Jerusalem.			
59. Paul arrives in Rome. 64. First traditional persecution of Christians, by Nero. 66. Outbreak of Jewish war. 67. Pope Linus. Vespasian despatched against the Jews.	65. Terminated at the death of Tigranes, when Tiridates accepts the crown of Armenia from Nero.	58. China: Ming-Ti introduces Buddhism.	
70. The destruction of Jerusalem by Titus.			
72. Conquest of Judea completed.	90. Death of Vologeses. Arsaces XXIV in alliance with the Romans, embellishes Ctesiphon.	71-130. Japan: Keiko and Yamato-Dake make large conquests.	75
95. Second traditional persecution of the Christians, by Domitian.			
			100
112-113. Third traditional persecution, by Trajan.	107. Chosroes (Arsaces XXV.), implicated in a war with Trajan on account of Armenia.	109. China: Conquest of Korea.	
NT OF THE EMPIRE.	117. Chosroes restored.		
	121. Vologeses II., (Arsaces XXVI.)	125. India: Nagar-Juna, great apostle of Buddhism.	125

VI. FROM THE BEGINNING OF THE ROMAN EMPIRE UNDER AUG

A. D.	German Nations		The Roman Empire—In Europe, Asia and Africa
	121. Roman wall from the Rhine to the Danube by Hadrian.		121. Builds a wall across the north of England.
			131. Improves Roman jurisprudence.
	140. **The Goths migrate southwards.**		138-161. ANTONINUS PIUS, whose reign was the happiest period of the Roman empire.
150			
			161-180. MARCUS AURELIUS, (Marcus Aurelius Antoninus), a wise and active sovereign, highly educated, a stoic philosopher.
			162-165. Verus successful against the Parthians.
	167-180. War of the league against Rome.		166. The Marcomanni, with their allies, penetrate as far as Aquileia.
	170. Invasion of Illyria as far as Aquileia.		
175			178. The Marcomanni and their allies renew the war with Rome, and before the close of it M. Aurelius dies, 180, at Sirmium.
	Franks	**Goths**	193-284. CIVIL WARS OF THE ROMAN EMPIRE.
			Period of Military Despotism
200	The name of Franks, (or free men), was given to a military confederacy of the lower Rhine and the Weser.	200. The Goths enter Dacia, and after crossing the Danube attack the Roman provinces.	193-211. Septimius Severus. Improvements in the administration of justice through the jurist Papinianus.
			208. Expedition to Britain against the Scots.
			211-217. CARACALLA, (Antoninus Bassianus). By the Constitutio Antoniana Roman citizenship was conferred upon all the inhabitants of the provinces. Systematic plundering of the provinces, unsuccessful wars against the Goths in Dacia, cruel treatment of the inhabitants of Alexandria. Plundering expedition against the Parthians.
225			222-235. SEVERUS ALEXANDER. Excellent ruler, advised by the jurists Domitius Ulpianus and Julius Paullus.
	238. They invade Gaul.	236-237. They invade lower Mœsia, and exact tribute of the Romans.	
250		250. The Goths, under their king, Ostrogotha, for the first time force their way into the Roman Empire by crossing the Danube.	248. Celebration of the thousandth anniversary of the foundation of Rome.
		258-69. Four great expeditions of the Goths into Asia Minor and Greece.	
			268-270. Claudius II. raised to the throne by the soldiers.
		272. They are driven from Illyricum and Thrace, and defeated also on the Danube.	270-275. AURELIANUS. He concluded peace with the Goths by the sacrifice of the province of Dacia. He defeated Zenobia in two battles, at Antiochia and at Edessa, subdued Syria, besieged and destroyed Palmyra, captured Zenobia, and reconquered Egypt, 273. Aurelian called "Restorer of the universal Empire."
		274. They obtain Dacia from the Romans.	
275			275. Tacitus, Imperator. He defeated the Alani, who had invaded Asia Minor.
	277. Extraordinary naval expedition of the Thracian Franks, in the Mediterranean and northern seas.	The Goths, in their progress southward, are joined by countless swarms of barbarians, and thus overwhelm the countries they invade.	276-282. Probus. Drove back the Franks, Burgundians, Alamanni and Vandals, entered Germany, and strengthened the wall between the Rhine and Danube.
			282-283. Carus succeeded. Conquered the Sarmatians.
	288. Maximian transplants a part of them into Gaul.	Gothic monarchy on the banks of the lower Danube and the northern coast of the Black Sea.	284-305. Diocletianus proclaimed imperator by the soldiers.
		290. They conquer the Burgundiones.	**Period of Absolute Imperialism.**
	294. Repeated migrations.		
300			
	306. Constantine defeats the Franks, who had invaded Gaul.		308. Rebellion in Rome. Six emperors.
			310-323. WARS OF CONSTANTINE THE GREAT.

USTUS TO ITS PERMANENT DIVISION, B. C. 30-395, A. D.—Continued

The Christian Church	Parthia	China, Japan, India	A. D.
145. Rise of the Marcionites.			
154. Canon of Scripture fixed about this time. JUSTIN MARTYR publishes his apology for the Christians.	149. Vologeses III., (Arsaces XXVII). Renewal of the war with Rome.		150
155. Martyrdom of Polycarp; appearance of Montanus.			
165. Death of Justin Martyr.	165. Casius destroys Seleucia.		
177. Fourth traditional persecution, by Marcus Aurelius—Irenæus becomes bishop of Lyons.			175
180. Age of Theophilus and Tatian.			
	191. Vologeses IV., (Arsaces XXVIII.)		
	207. Defeated by Septimius Severus, who sacks the chief towns of Parthia.	201-269. Japan: JINGU-KOGO, most famous of Japanese female sovereigns.	200
	216. Artabanus IV., (Arsaces XXX), the last of the Arsacidæ.	221-265. China: Epoch of the "Three Kingdoms."	225
	Persia		
	226-651. Dynasty of the Sassanides. 226-240. Artaxerxes becomes the founder of the new Persian monarchy.		
235. Origen. Sixth persecution of the Christians, under Maximinus.			
248. Cyprian becomes bishop of Carthage.—Monastic life originates about this time. Dispute between the churches of Rome and Africa about baptism.			250
251. Seventh persecution of the Christians, under Decius.			
257. Eighth persecution, under Valerian.	257. War against the Romans: Sapor advances as far as Cappadocia. The Emperor Valerian taken prisoner.		
260. Paul, of Samosata, bishop of Antioch, denies the divinity of Jesus Christ.			
270. MANES advocates his doctrines in Persia.	*The Sassanidæ, claiming to be descendants of the ancient kings of Persia, form pretensions to all the Asiatic provinces of the Roman Empire.*	270-310. Japan: OJIN, a great warrior.	
274. Ninth persecution, under Aurelian.			275
	292-301. Narses.		
	301-309. Hormisdas II., builds Ormus.		
303. Tenth persecution of the Christians, by Diocletian.			300
305. Persecution of the Christians stopped by Constantius Chlorus.			
	309-380. Sapor II carries on a series of wars with Rome.		

VI. FROM THE BEGINNING OF THE ROMAN EMPIRE UNDER AUG

A. D.	Franks	Goths	The Roman Empire—In Europe, Asia and Africa
325			323-337. CONSTANTINE, THE GREAT, sole ruler. Christianity recognized by the State and favored at the expense of paganism.
			330. Seat of empire moved to Constantinople.
			337. On the death of Constantine the Great, the empire was divided between his three sons: Constantine, Constans and Constantius.
350	356-7. Franks and Alemanni pour into Gaul.	350. Hermanric, King of the Ostrogoths, founds an extensive empire.	361. JULIAN, called the Apostate. Disliked Christianity, and tried to restore paganism.
	365-371. Valentinian drives the Alemanni out of Gaul.	366. The Goths invade Thrace, but are defeated by the generals of Valens. Upon the invasion of the Huns, the Ostrogoths separate from the Visigoths.	364. Empire divided into East and West with an emperor ruling in each. WEST: 364. Valentinian I. EAST: 364. Valens, killed by Goths.
375			375-493. INVASION OF ROMAN EMPIRE BY NORTHERN BARBARIANS.
		375. Death of Hermanric and fall of his empire. 376. The Visigoths pressed by the Huns, implore the protection of Valens, and cross the Danube into Mœsia, which he cedes to them.	375. Gratian and Valentinian II. 383. Valentinian II. 379. Theodosius I. Became a Christian; kept back the Goths; divided Armenia between Rome and Persia.
			394. The whole empire was, for the last time, reunited under 394-395. THEODOSIUS. After his death the division of administration into an eastern and western section, which had existed for a hundred years, became a permanent division of the empire.
			395. *DIVISION OF THE EMPIRE BETWEEN THE*

VII. FROM THE BEGINNING OF THE MIDDLE AGES TO THE

GREAT EVENTS OF PERIOD. Invasion of the Germanic Tribes. Middle Ages begin. 500-600: Great disorders in the West. Beginnings of Feudalism; power of the clergy increases. danism from Arabia to Siude on the east, and Carthage on the west. Christianizing of Germany.

A. D.	Britain	Western Part of the Roman			
		Spain	Gaul (Franks)	Germans	Italy
400	**I. Roman Period** (B.C.55-410 A.D.)				395-423. Honorius, Emperor. Capital Rome, Ravenna imperial residence after 402.
					402. ALARIC invades Italy. Stilicho collects an army from Gaul, Britain, etc., and defeats him at Pollentia and Verona. 408. Stilicho slain. Alaric's third invasion. 410. Alaric captures and sacks Rome.
	410. The Roman troops being gradually withdrawn, the natives become independent.	409. Gerontius, the Roman governor, invites the Vandals, Alani and Suevi into Spain. 415. The empire of the Visigoths.	412. Ataulphus, with the Visigoths, leaves Italy, conquers Narbonne and Toulouse.	413. **Kingdom of the Burgundians** founded by Gondicar.	
425	*The Scots and Picts continually harass the island, and the Franks and Saxons infest its coast.*	429. Empire of the Vandals.			423-455. The greater part of Gaul and Spain lost. 437. Pannonia, Dalmatia and Noricum, lost to the Greek Empire.

USTUS TO ITS PERMANENT DIVISION, B. C. 30-395, A. D.—Continued

The Christian Church	Persia	China, Japan, India	A. D.
311. Pope Miltiades. Constantine issues Edict of Toleration.		313. Japan: Nintoku, the Sage Emperor.	325
320. Strife of the Donatists in Africa.		320. India: CHANDRAGUPTA, first supreme emperor of India.	
325. The Council of Nice, consisting of three hundred and eighteen bishops, who condemn Arianism. ATHANASIUS, ARIUS, flourish in the reign of Constantine.	326. Persecution of the Christians.	*Brilliant Gupta Period from 320 to 480.*	
337. Pope Julius I.	337-363. War with Rome. Sapor demands the restitution of all the provinces Persia had formerly possessed in Asia Minor.		
340. Christianity propagated in Ethopia by Frumentius.—Gothic version of Bible by Wulfila (Ulfilas).			
352. Pope Liberius. Hilary of Poitiers.—Cyril, Bishop of Jerusalem.			350
363. Jovian. Restored Christianity.	362-3. War with Julian, who is slain in repulsing the Persians, on the Tigris.		
	372-420. Peace with Rome.		
375. Ambrose of Milan; Martin of Tours.		375. India: Chandragupta II. extended the empire.	375
	380-383. Artaxerxes II.		
381. The second general council of Constantinople. Gregory of Nazianzus made patriarch of Constantinople.	383-388. Sapor III. Division of Armenia between Persia and Rome.		
SONS OF THEODOSIUS, HONORIUS AND ARCADIUS.			

FORMATION OF THE MOHAMMEDAN EMPIRE, 395-622 A. D.

Anglo-Invasion of Britain. 400-500: Fall of the Roman Empire. Beginning of new states. In the East the great reign of Justinian. 600-700: Rise and wonderful spread of Mohamme-

Empire / Church	Eastern Empire	Persia	China, India, Japan	A. D.
	395. Arcadius received the Eastern Empire, also called the Byzantine or Grecian Empire. Capital Byzantium or Constantinople.	399-420. Isdegerdes favors the Christians.		400
400. CHRYSOSTOM, patriarch of Constantinople; *ST. AUGUSTINE.*				
402. Pope Innocent I.				
412. Cyril, Bishop of Alexandria.		412. Conquers Armenia.		
	414-53. Regency of PULCHERIA.			
416. The Pelagian heresy condemned by the African bishops.				
422. Pope Celestine I.	420-22. Persian War on account of persecution of the Christians.	420-440. Varanes V.	420. China: Close of Isin dynasty.	425
432. St. Patrick preaches the Gospel in Ireland.	431-440. Armenia divided between the Persians and Romans.			
	438. *Theodosian Code.*			
440. Pope LEO I. the Great, greatly extends the power of the bishop of Rome.	441. Invasion of the Huns; who ravage Europe to the walls of Constantinople.	440-457. Varanes VI., Legislator.		

VII. FROM THE BEGINNING OF THE MIDDLE AGES TO THE

A. D.	Britain	Western Part of the Roman			
		Spain	Gaul (Franks)	Germans	Italy
	II. Anglo-Saxon Period (449-1066)		448-456. Merovius powerfully assists in the defeat of Attila, and thus gives his name to the first race of French kings.	449. The Saxon invasion of England.	
450		451. Invasion of Attila, with half a million Huns. The Huns under Attila, called the "Scourge of God," defeated by the confederate armies of Romans and Visigoths at **Chalons.**	450. Dynasty of the **Merovingians.**		452. Attila returns from Gaul into Italy. Pope Leo saves Rome.
	455-556. Saxon Octarchy. 455. Hengist, founds the kingdom of Kent.	466-483. Gothic Monarchy of Spain.	455. The Britons settle in Bretagne. 457. Childeric conquers to the Loire, including Paris.	456. The Alemanni follow the Burgundians into Alsace. The river Aar in Switzerland becomes the boundary between them.	455-476. From the assassination of Valentinian, ten emperors rapidly succeed. 455. Genseric and the Vandals plunder Rome. 461. Ricimer, leader of the Goths, reigns under the name of Severus III. 474. Ricimer sacks Rome.
475					476. Odoacer, King of the Heruli, overthrows the Western Empire, and founds the Kingdom of Italy.
		NEW NATIONS FORMED OUT OF THE ROMAN EMPIRE			
		Spain	**Franks**	**Germans**	**Italy**
		Kingdom of the Visigoths.	**Kingdom of the Franks.** 481-511. Clovis, the true founder of the French monarchy: capital Paris. 486. Defeats Syagrius at Soissons. End of the Roman Dominion.	491-516. Gondebald, King of Burgundy.	493. Italy conquered by Theodoric, King of the Ostrogoths. Odoacer put to death. **493-555. Kingdom of the East Goths** (Ostrogoths) in Italy.
			496. Conversion of Clovis. He defeats the Alamanni.		
500				506. Burgundy tributary to the Franks.	500. Edict of Theodoric.
		508-522. Theodoric the Great, King of the Ostrogoths, rules the affairs of Spain—he preserves Narbonne, wrested from the Visigoths by Clovis, to this empire, but joins Arles and Provence to his own.		516. Sigismond.	508. Conquest of Arles and Provence.
	519. Kingdom of Wessex (West) Saxons) which ultimately unites to itself the whole English monarchy.				
525		522-531. Amalaric, the first Gothic king who establishes his court in Spain: capital, Seville.		523. Godomar.	
					533-555. WARS OF JUSTIN
					535-553. Unsuccessful war with Justinian, the troops revolt and elect Vitiges, 536-541.
			536. Witiges, King of the Ostrogoths, surrenders his possessions in Gaul to the Franks.		536. Belisarius takes Rome.
			537. Witiges besieges Belisarius in Rome. 540. Byzantine power established in Italy.		537. It endures a long and disastrous siege from Vitiges.
550					541-552. Totila re-establishes the powers of the Ostrogoths.
					552. Narses, the general of Justinian, invades Italy, overthrows the Gothic monarchy. 554. Italy under Greek Exarchs.
			558-561. Clotaire sole monarch.		

FORMATION OF MOHAMMEDAN EMPIRE, 395-622 A. D.—Continued

Empire: Church	Eastern Empire		Persia	China, India, Japan	A. D.
451. The fourth general council at Chalcedon, at which Eutychianism and Nestorianism are solemnly condemned.	454. The Ostrogoths, after Attila's death, settle in Pannonia and Mœsia.				450
	457-474. LEO THE GREAT. The first emperor crowned by a patriarch of the Greek Church.		457. Firoz, one of the most celebrated princes of Persia.		
	474-491. ZENO. 475. The Ostrogoths. THEODORIC brought up as a hostage at Constantinople, becomes chief of the whole nation. He invades the empire, ravages Thrace with great cruelty.			480. India: End of Gupta dynasty.	475
482. The Emperor Zeno publishes the *Henoticon*. 492. Pope Gelasius I. He advances bold claims to authority.	489-493. Theodoric's expedition from Thrace, etc., into Italy.				
	493. The Kingdom of the Ostrogoths.				
496. Christianity introduced among the Franks, whose king, Clovis, accepts baptism.	502-505. War with Persia. 507. Long walls built to protect Constantinople from the Bulgarians.				500
518. The accession of Justin marks the downfall of the Monophysites.	518-527. Justin. Proclus his minister. 518-565. *Brilliant period of the Byzantine Empire.*				
527. Separation of the Armenian from the Greek Church. 529. The Order of Benedictine Monks instituted at Monte Cassino, near Naples.	527. JUSTINIAN I. becomes emperor; celebrated for his *code of laws* and the victories of his generals, BELISARIUS and NARSES.				525
	530. Belisarius defeats the Persians at Daras.				
	532. Suppresses the Nika riot in the Hippodrome of Constantinople.		531-579. Chosroës I., "The Just," greatest of the Sassanid kings. War with Justinian. Invasion of Syria and capture of Antioch. Belisarius in Syria.		
IAN AGAINST THE VANDALS AND OSTROGOTHS.	533-534. Overthrows the Vandals in Africa. 535. Subdues Sicily.				
	536. Belisarius and Narses recover Italy.				
544. In the Edict of the Three Chapters, Justinian largely repudiates the work of the Council of Chalcedon.	553. Narses defeats and kills Totila and overthrows Gothic kingdom in Italy.	**Turks** settled in Asia ab. 545-550	549-551. Siege of Petra.	552. Japan: Buddhism introduced.	550

VII. FROM THE BEGINNING OF THE MIDDLE AGES TO THE

A. D.	Britain	Western Part of the Roman			
		Spain	Gaul (Franks)	Germans	Italy
			561. Chilperic I. (the French Nero), King of Neustria, married the beautiful Fredegonda. 561-575. Sigebert, King of Austrasia, wife Brunehilda.	Many Germanic tribes, particularly the Bavarians and Saxons join the Lombards and Avars in their invasion of Italy.	**Kingdom of the Lombards** 568. Italy conquered by the Lombards under Alboin. He later fixes his capital at Pavia. 568-752. The Exarchate of Ravenna established.
575	575. East-Anglia, is formed into a kingdom. The name of *Angle-land* was given to a small part of the eastern coast, *East-Engla-land.*				580. The Latin language ceases to be spoken in Italy, while it supersedes Gothic in Spain.
	586. The kingdom of Mercia was the last founded by the Angles. 588-828. WARS OF THE HEPTARCHY. 590-616. Supremacy of Ethelbert, King of Kent.	586-601. Recared good and prosperous reign establishes the Catholic faith throughout Spain—the clergy obtain great authority. *The Latin language supersedes the Gothic.*			
600	Ethelbert publishes the first *Code of Laws* in Britain.		613-628. Clotaire II., sole monarch, grandson of clovis, his power extends over all the Gauls to the Pyrenees — the Saxons and Lombards tributary: capital, Paris.		

VIII. FROM THE BEGINNING OF MOHAMMEDAN POW

GREAT EVENTS OF PERIOD. 700-800: Christianizing of Germany continues. Hostile magne, who nominally restores the Western Roman Empire. Norman ravages begin. 800-900:

A. D.	Britain	Spain	Franks and Germans	Italy and Church
	617-685. The Northumbrian Supremacy: Northumbria Mercia, and Wessex.		*The power of the mayors of the palaces increases by their being appointed regents over the countries conquered by Clotaire.*	
625	617. Edwin embraces Christianity and becomes powerful. Began a basilica at York.	623. The Greeks expelled from Spain.	628-633. Dagobert I., King of all the Frankish realms.	625-638. Honorius I. Much money spent in building churches. *Africa and Asia, with the churches of Jerusalem, Alexandria, and Antioch, lost to the Christian world by the progress of Mohammedanism.*
	633-655. Feuds among the Saxon Kings.		633. Death of Dagobert I., and long minority rule of his sons.	

FORMATION OF MOHAMMEDAN EMPIRE, 395-622, A. D.—Continued

Empire / Church	Eastern Empire		Persia	China, India, Japan	A. D.
560. Pope John III. The Tritheists maintain the separate existence of the persons of the Trinity.	565. Death of Belisarius and Justinian. Justin II. becomes emperor. 570-600. The Avars invade the Eastern Empire, and spread over Hungary, Poland and Prussia. 571-591. Wars with Persia. 578-582. Tiberius II. 582-602. Maurice. The empire extended to the Araxes, and almost to the Caspian.	569-582. The Turks send embassies to the Greek emperor—treaty between them.	579-590. Hormisdas III.		575
590-604. GREGORY I. the Great. Canon of the mass established. 607-614. Boniface IV. *The Anglo-Saxons embrace Christianity—as do also, during this century, the Frieslanders, Westphalians, Thuringians, Danes, Swedes, Germans, and Franks.*	592. War with the Avars. 603-628. War with Persia.	600. Arabia became the theater of important events which greatly influenced the history of the East. 609. *MOHAMMED* proclaims his religion.	591-628. Chosroes II. 603. Invades the Greek Empire—conquers Syria, 611; Palestine and Jerusalem, 614; Egypt, 616 and Asia Minor except the coasts—overrun Africa. *Splendid court of Persia.*	590-618. China: Dynasty of Suy. 593-600. Japan: strong Chinese influences.	600

ER TO THE TREATY OF VERDUN, 622-843 A. D.

caliphates of Bagdad and Cordova. Mohammedan advance in the West checked by Charle-
Norman ravages continue. Private wars. Charlemagne's Empire falls to pieces.

Eastern Empire	Saracen Empire	Persia	China, Japan, India	A. D.
622-625. Successful expeditions of Heraclius against the Persians. 628. Peace with Persia.	622. The Hegira, or Flight, of *MOHAMMED*. He enters Medina, and is acknowledged as prophet and military sovereign. 623-632. Conquers all Arabia.	622. Invasion of Heraclius. 627. Victory of Nineveh. 628. Conquest of Madain; Chosroes; flees; revolution; he is deposed and murdered by *his son*.	618-907. China: Dynasty of Tang.	625
632-1492. SARACEN OR MOHAMMEDAN WARS.				
	632-634. Abu Bekr, Mohammed's father-in-law, succeeds as Caliph, and reigns from the Euphrates and Tigris to the Mediterranean. 633. The Greeks defeated in Syria by the Arabs, under Khaled, who captures Damascus. 634-644. Omar. Egypt and part of Syria subdued.	Peace with Constantinople. 632-651. Yezdejird, the last king. The Arabs attack Persia and under Othman, completely subdue it.		

VIII. FROM THE BEGINNING OF MOHAMMEDAN POWER TO

A. D.	Britain	Spain	Franks and Germans	Italy and Church
		638. Council of Toledo; decree against the Jews.	636-687. Continued decline and final decay of the Merovingians.	636-652. Rotharis. *Legislation of Rotharis and gradual formation of the Italian language.* Invasion of the Slavs, who are repulsed.
650	656-675. Mercia, shakes off the yoke of Northumbria. *Northumbria declines, but Wessex and Mercia increase in power.*			649. Pope MARTIN I. 662. Grimoald, Duke of Benevento, comes to aid Gondebert, but kills him and siezes the crown. 664. Roman Christianity triumphs in England at the Council at Whitby.
675				680-681. The sixth general council at Constantinople condemns the Monothelites.
			687-714. Pipin, Mayor of the Palace. The Alemani, Bavarians, Frisons, Thuringians and Saxons, while France is occupied with the dissensions of the mayors of the palace, shake off the Frankish yoke.	
700		711. Tarik lands at Gibraltar, gains a decisive victory at Xeres, 712, in which Rhoderic, the last of the Goths is killed. END OF GOTHIC MONARCHY OF SPAIN. 713-714. Tarik and Musa complete the conquest of Spain. The Christians maintain themselves in the Asturias and Navarre.	715. Death of Pipin, succeeded after a long struggle by his son. 715-741. CHARLES MARTEL. Complete master of the French monarchy. 720-729. The Arabs invade France, but are several times defeated and driven back by Eudes, Duke of Aquitaine.	697. Venice begins to have its Doges. 710. Emperor Justinian II. confirms the Roman See in its privileges. 712. Constantine opposes the emperor Philippicus Bardanes in the question of the Monothelite heresy. 712-744. Luitbrand, a great and virtuous prince. Luitbrand takes advantage of the civil broils in Italy, captures Ravenna and several cities from the pope. 715. Pope GREGORY II. engages in controversy with the Emperor Leo the Isaurian over image-worship.
725				722. Boniface consecrated bishop for Germany. 730. Gregory excommunicates the emperor. 731. Pope GREGORY III.
		739. Alfonso founds the kingdom of Leon which maintains its independence till 1230.	732. Charles Martel gains the decisive victory of **Tours** which saves the liberties and religion of Europe.	
750			**Carlovingian Dynasty** 751. With Pipin the Short (741-768), Charles Martel's son, the Carolingians became kings of the Franks.	749-756. Aistulf. 752. He defeats the Greek exarchs, and demands a tribute from Rome.
			END OF THE GREEK EXARCHATE 754-756. Pipin makes two expeditions into Italy and bestows the exarchate upon the pope, thus laying the foundation of the temporal power of the Papacy.	
	755-794. Offa, King of Mercia, overthrows the armies of Sussex, Kent, Wessex and founds the Abbey of Bath and of St. Albans.	755-1031. **Caliphate at Cordova.** 755-787. Abderrahman having escaped from Bagdad, wrests Spain from the caliphate of the Abbassides —establishes a military government.		756. Commencement of the pope's temporal power under the auspices of Pipin, who bestows on Stephen the exarchate of Ravenna. Didier, the last king, quarrels with Pope Adrian 772, at whose request Charlemagne crosses the Great St. Bernard from Geneva, takes Pavia, dethrones Didier, and thus, 774, ENDS THE KINGDOM OF THE LOMBARDS which had lasted 206 years.

THE TREATY OF VERDUN, 622-843 A. D.—Continued

Eastern Empire	Saracen Empire	Persia	China, Japan, India	A. D.
	637. Captures Jerusalem. The Christians allowed the exercise of their religion—paying tribute. Omar founds a mosque at Jerusalem, which Moslems consider nearly as sacred as Mecca.	637. Ctesiphon taken and sacked by the Arabs.		
640. The Slavs found the kingdom of Servia and Croatia.	640. Alexandria captured by Amru, and its library burned.			
641-668. Constans II.	644-655. Othman builds a fleet.		645. Japan: Rise of the famous Fuji Wasa family, influential for 400 years.	
	647. Amru captures Mauritania and nearly all northern Africa.	652. Persia passes under the Saracens.		
	648. Cyprus captured, and			
	653. Rhodes—complete destruction of the celebrated colossus.			650
	661-680. Moawiah makes Damascus his capital, forms a navy; invades Sicily; besieges Constantinople.			
668-685. Constantine IV. (Pogonatus.)				
668-675. First siege of Constantinople by the Arabs—the Greek fire saves the city.				675
680. Kingdom of the Bulgarians founded between the Danube and the Balkan, lasts till 1018, when it is again a Greek province.				
685. Justinian II. breaks the truce with the Saracens, is defeated, and compelled to relinquish Armenia.	696. Armenia subdued, and			
	697-725. The provinces between the Black and Caspian Sea.			
	698. Carthage razed, and the north coast of Africa completely subjugated.			700
	711. Battle of Xeres destroyed the kingdom of the Visigoths in Spain.			
			712. India: Abab conquest begins.	
718-741. Leo III., the Isaurian.				
			720. India: Parsees settle at Bombay.	725
726. Edict forbidding image worship.				
	732. Saracens defeated by Charles Martel at Tours.			
	750. Savage civil wars among Saracens. **Caliphate of Bagdad under the Abbasides** (750-1258).			750
	755. Saracen Empire divided. Abderrahman, escaped to Spain, and founded there the			
756. The exarchate of Ravenna lost.	756. Caliphate of Cordova.			
	762. Bagdad becomes the seat of Caliphs the center of commerce, and rises to great opulence and splendor.			
			763-80. China: Incessant Tartar invasion.	

VIII. FROM THE BEGINNING OF MOHAMMEDAN POWER TO

A. D.	Britain	Spain	Franks and Germans	Italy and Church
775	789. First landing of Northmen in Britain.	791-842. Alphonso II., the Chaste, defeats and expels the Arabs, who invade his dominions, and from this time may be dated the real *independence of the Christians.*	768-814. CHARLEMAGNE, and Carloman, the former one of the greatest monarchs, becomes sole ruler upon the death of Carloman, 771.	768. Pope STEPHEN III. 772. Pope HADRIAN I., whom Charlemagne confirms in possession of Pipin's donation. 787. The seventh general council at Nice, in which the doctrine of the Iconoclasts was condemned. 795. Pope LEO III. Image-worship condemned by Synod of Frankfort.
800	802. Egbert, King of Wessex.		800. Charlemagne or Charles the Great crowned Emperor by Pope Leo III. The Holy Roman Empire founded. It included all France, Germany, Spain to the Ebro, Italy to Benevento, several isles of the Mediterranean, and the greater portion of Pannonia.	
825	827. Egbert becomes king of all England.		806. Charlemagne divides the empire between his three sons, two of whom die, 810, 811. 808. **Descent of the Normans or Northmen upon France.** Many bishoprics founded—Great increase of monastic institutions. 813. National assembly at Aix. Louis co-ruler. Charlemagne dies there 814. 814-840. Louis, the Pious, crowned emperor at Rheims, 816, by Pope Stephen IV. 817. Louis divides the empire between his three sons, and, 823, a fourth, Lothaire, is associated in the empire. 820. Second invasion of the Normans. 830. Rebellion of Louis's three sons, and succession of quarrels between them till Louis's death—Field of lies at Alsace, 833—Louis is deposed, but soon restored.	
	837. Ethelwolf succeeds to the throne.	842. Ramiro I., King of Orildo.	841. Battle of Frontenai between Lothaire, Charles and Louis; Louis is defeated. 843. PARTITION OF THE CARLOVINGIAN EMPIRE AT VERDUN, *when properly begins the history of France, Germany and Italy as separate states.* The Treaty of Verdun was originally merely a family contract, made without regard to national differences. In Louis' kingdom, however, the German element was in the majority; in that of Charles the Romance element prevailed. Thus there developed, in the course of the following centuries, from the East Frankish element the German, from the West Frankish the French nationality. The East Franks called their language, in contrast to the Latin used by the educated clergy, the deutsche, i. e. the language of the people, and gradually those who spoke Deutsche came to be called Deutsche, or German.	
		844. Irruption of the sea kings.	**France**: 843-987. Carolingian Kings of France. 843-877. Charles the Bald obtains France; boundaries: the Meuse, Saone, Rhone Scheldt and Ebro. **Germany**: 843-911. Carolingians in Germany. 843-876. Louis the German obtains Germany to the Rhine, with Mayence, Spires and Worms. **Italy**: 843-875. Carolingians in Italy. 843-855. Lothaire, Emperor, obtains Italy and Lotharingia, or Lorraine. *The power of the monarchs declines, and the nobles become independent. The empire by the almost universal system of division and subdivision, is broken up into an immense number of feudal states.*	

THE TREATY OF VERDUN, 622-843 A. D.—Continued

Eastern Empire	Saracen Empire	Persia	China, Japan, India	A. D.
787. Irene restores the worship of images.	786. Haroun-al-Raschid, Caliph at Bagdad. The Empire broke into a number of separate States at his death. *Arab art flourishing, and Arab civilization at its zenith.*			775
			794. Japan: Kioto becomes the capital.	
797-802. Irene reigns alone, after killing her own son. 801. Negotiations with Charlemagne respecting a marriage with him and a union of the two empires. 802. Irene is deposed by Nicephorus, and banished to Lesbos—died 803.			800-855. India: Rise of the Rajput states.	800
802-811. Nicephorus. 803-806. The Saracens defeat the Greeks, ravage Asia Minor, capture Cyprus, and compel Nicephorus to pay a tribute.				
811. Nicephorus is defeated and killed by Crunnus, King of the Bulgarians. 813-820. Leo, the Armenian.	813-833. Mamun. The reign of this prince may be regarded as the Augustan period of Arabian literature. Immediately after the reigns of Haroun-al-Raschid and Mamun the power of the caliphs began to decline.			
820-829. Michael II., the Stammerer. 823. Crete lost the Arabs, and Sicily to the African Aglabites. 829-842. Theophilus.	827. Saracens landed in Sicily and gradually conquered it. 833. El Motassem, Caliph. *Struggle with Byzantine Empire continued throughout the century. Mohammedan rule firmly established in Egypt.*			825
837. Wars with the Saracens. 842. Empress Theodora restores image worship.	840. Arabs sailed up the Tiber to Rome. Sacked St. Peter's and St. Paul's.		840. Bhoga master of the country from Gwalior to the Himalayas.	
The empire, hard pressed by Arabs, Bulgarians, and Magyars. The Emperors Nicephorus Phocas and John Zimisces, whom Theophano, widow of Romanus II. (died 962), placed on the throne, partially reconquered the provinces which the Arabs and Bulgarians had torn from the empire.	Though the political power of the Bagdad Caliphate continued to decline, during the whole of the ninth century the eastern capital continued to be the chief center of learning, literature and culture in striking contrast with the west.		Great Stone Temple at Ellora about this period.	

NOTE: The comparative outline of the History of Nations is continued by Table IX.

EGYPT'S STORY SCULPTURED IN ETERNAL ROCKS

THE SPHINX AND PYRAMIDS AT GIZEH

This most mysterious of all Egyptian sculptures stands near the Second Pyramid. The body of the Sphinx is one hundred and fifty feet long, its paws are fifty feet and its height is seventy feet (See pages 000, 000).

This wonderful temple at Abu-Simbel in Nubia is the most northerly of a group of three, but is separated from the others by a deep ravine. It was dedicated to the goddess Hathor, and built by Rameses the Great in the side of a deep cliff. The portrait statues are thirty-three feet in height and represent Aahmes and his queen Nefertari.

ISRAEL IN EGYPT—From a Painting by Sir Edward J. Poynter

This picture portrays the hardships of the enslaved peoples in Pharaoh's time. Not only the Israelites but the Egyptians as well were forced into service to build the great Pyramids to immortalize Egypt's rulers.

THE SPELL OF EGYPT: ANCIENT AND MODERN

FOR HOARY antiquity, for the massive and sublime, for the quaintly picturesque, Egypt stands unrivalled in the world,—the region where the Pharaohs reigned, where Moses grew from birth to manhood, where Joseph came forth from a dungeon to rule in wisdom at the king's right hand, and whence the chosen people of God went out into the wilderness towards the promised land.

THE BEGINNINGS OF THE OLDEST CIVILIZATION

When the Egyptians first appear on the page of history they are already possessed of a marvelously advanced civilization, extending back thousands of years before the even remote period of the pyramid builders. Long before the chosen people, the Hebrews, came into possession of the promised land of Canaan, Egypt had kings, priests, cities, armies; laws, temples, learning; arts and sciences and books. Egypt is, beyond all other lands, the land of ruins, surpassing all in gigantic and stately monumental remains, the result of immense human labor.

HOMELAND OF THE EGYPTIANS

Egypt proper occupies little more than twelve thousand square miles. Including the oases in the Libyan Desert, the region between the Nile and the Red Sea, and El-Arish in Syria, but excluding the Sudan, the area is about four hundred thousand square miles.

In ancient as in modern times Egypt was always divided into the Upper and Lower, or the Southern and the Northern country; and at a very early period it was further sub-divided into a number of *nomes*, or departments, varying in different ages. It is practically confined to the bed of the flooded Nile, a groove formed by its waters in the desert; and the bordering desert and the southern provinces of Nubia, Khartum and others, toward the equator form no part of the Egypt of nature or of history, though from time to time they have been politically joined to it. Without the Nile Egypt would never have existed; and therefore a brief account of this wonderful river is very important.

THE LIFE GIVING RIVER NILE

Though the longest river in Africa, the Nile has little historic interest above Khartum, where the White Nile and Blue Nile unite their waters. Below Khartum navigation is rendered extremely dangerous by the cataracts which obstruct the bed of the river, the sixth occurring not far north of Khartum, the first near Assuan, in Egypt. The Nile enters the Mediterranean

by a delta which separates into two main channels, the Rosetta and the Damietta, which are intersected with canals. The valley of Upper Egypt is narrow, and the fringe of mountains on either side are of no great height, so that the landscape varies but little and might appear to be monotonous but for the rich and wondrous coloring of all the scenery, the vivid green of the fields, the rich red-brown of the river, the bright yellow of the rocks, with overhead a deep blue sky and brilliant sunshine. The river flows into Egypt proper north of the second cataract, a little south of Wadi-Halfa. The Blue Nile joins the river at Khartum; this stream brings down an immense quantity of red mud. The cataracts are six in number.

THE NILE'S ANNUAL OVERFLOW

The important feature of the river is its annual inundation. At the end of May the river is at its lowest level, it rises gradually in June and continues rising until the middle of September; it then remains stationary from two to three weeks, rising again until the end of October; it is then at its highest level and begins gradually to fall, until by May it is once more at its lowest. The river rises from twenty-one to twenty-eight feet; when it did not reach this level the crops failed, and when it exceeded it, the land was overflowed and ruin faced the people. Nowhere in the world is there such a large population depending solely on the produce of the soil.

THE RISE OF IRRIGATION BEGINS WITH THE NILE

As the climate is exceedingly dry, irrigation became as early as the second dynasty (about 4514 B. C.) an object of national importance. All through the ages can be marked the tireless persistence and mechanical ingenuity employed in the problems of irrigation. During the nineteenth century, Mehemet Ali Pasha began a gigantic system of canals and locks and weirs. A French engineer of great ability, Mougel Bey, was employed to carry out this difficult task; his great barrage across the Nile, at the apex of the delta, is still a very impressive work; unfortunately the system was a failure. Later British engineers undertook the management of irrigation, and in 1902 the Nile dam, at the head of the first cataract above Assuan, was completed. The dam is such a height that the beautiful temples on the islet of Philæ are partially submerged; and during several months of the year the ruins are no longer visible.

EGYPTIAN LAKES, CLIMATE AND OASES

The chief lakes of Egypt, from west to east are Mareotis, Edku, Burlus, and Menzala; these lie only a few miles from the coast and are shallow and brackish. The seven famous natron lakes lie in a valley in the desert, eighty miles from Cairo. In the province of the Fayum is the Birket-el-Kerum, thirty miles long and five miles wide, forming the remains of the ancient Lake Moeris, which Herodotus believed to have been artificially constructed.

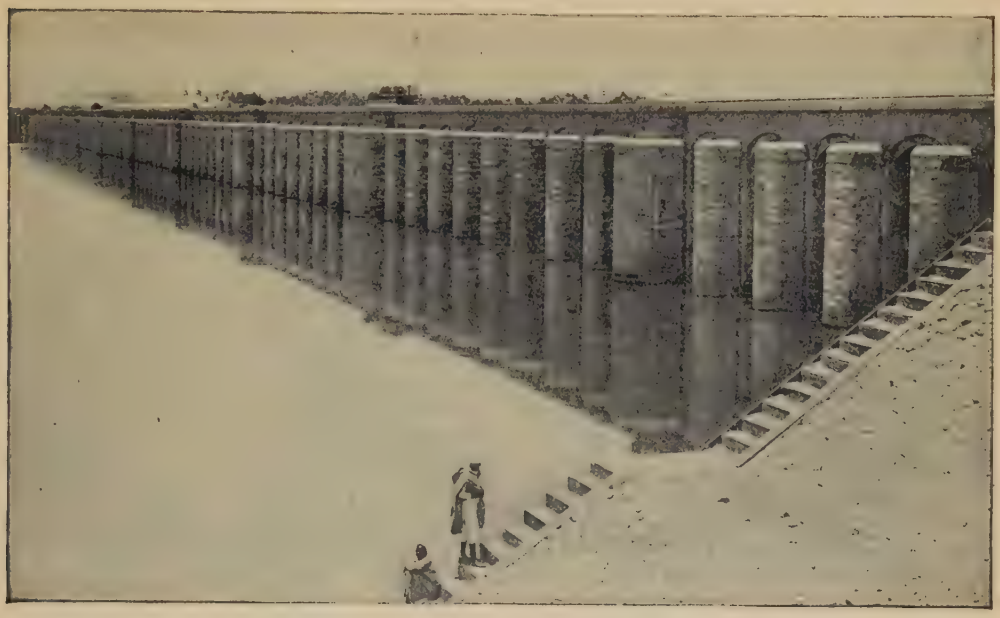
The climate is extremely dry. Egypt lies in an almost rainless area. The days are warm and the nights are cool. January is the coolest month. On the coast rain falls during the winter months, but snow is unknown. In Sinai, snow occasionally falls during the winter, and heavy storms of rain occur, which occasionally flood the rocky ravines. One interesting feature of the climate is the continuous north wind, which blows throughout the year, and the sailing boats are thus able to ascend the Nile against the strong current. During the spring the Kamsin occurs, a hot, dry south wind laden with sand, forming a yellow stifling fog almost obscuring the sun; it lasts from one to three days.

There are five large oases or fertile places in the western desert—Siwa, Baharia, Kharga, Dakla, and Farafra. These have been occupied since 1600 B. C. Kharga possesses a temple of Ammon, built by the Persian conquerer, Darius I., and also other interesting ruins of the time of the Ptolemies. Siwa contains the oracle temple of Jupiter Ammon, consulted by Alexander the Great. The town is built on the rocks and has the appearance of a fortress.

ANCIENT POPULATION OF EGYPT

The population of the country must have been large at the earliest period, as one hundred thousand men were employed in the construction of the Great Pyramid alone during the fourth dynasty,

TITANIC IRRIGATION DAMS OF MODERN EGYPT



THE BARRAGE AT ASSIOUT ACROSS THE NILE

This dam, though not so large as that of Assuan, is still a gigantic structure. It is over half a mile in length and its massive wall is pierced by one hundred and ten bays or sluices, each over sixteen feet in width.

This is a view of the great dam at Assuan, across the Nile in upper Egypt, showing the ruins of the beautiful Temple of Philæ partially submerged. The Assuan dam was the largest in the world until the completion of the Elephant Butte dam, New Mexico, in May, 1916.

nearly 3600 years B. C. It has been placed at seven million under the Pharaohs, distributed in eighteen hundred towns, which had increased to two thousand under Amasis (525 B. C.), and upwards of three thousand under the Ptolemies. In the reign of Nero it amounted to seven million eight hundred thousand. In 1707 it was eleven million, one hundred and forty thousand in Egypt proper, or, including Nubia and other dependencies nearly twenty millions.

HOW WE KNOW THE HISTORY OF EGYPT

Until the last century, what we knew about ancient Egypt was mainly obtained from Greek and Roman historians. At the present time our knowledge of the "land of pyramids and priests" has been greatly increased by the deciphering of the inscriptions on the monuments, and by extended observation of the countless sculptures in which the olden Egyptians have recorded their ways of life, their arts, arms, sciences, religion and customs. In carving or in painting, the obelisks, the temple walls, and temple columns, the inner walls of tombs, the coffins of the dead, artistic objects—all are covered with the strange characters known as hieroglyphics.

THE STORY OF THE HIEROGLYPHICS

This word, of Greek extraction, means "sacred carvings," given to the sculptures in the supposition that all such characters were of religious import, and known only to the priests of ancient Egypt. The meaning of the characters had been lost for hundreds of years, and the word "hieroglyphics" had long become proverbial for mysteries and undecipherable puzzles, when a keen-eyed Frenchman put into the hands of scholars the clew to their translation.

DISCOVERY OF THE ROSETTA STONE

An artillery officer of Napoleon's army in Egypt, named Bouchart, discovered near Rosetta, in 1799, an oblong slab of stone engraved with three inscriptions, one under the other. The upper one (half of which was broken off) was in hieroglyphics, the lowest one was in Greek, and the middle one was stated in the Greek to be in the written characters of the country. The Greek inscription told scholars that all three inscriptions expressed a decree of the Egyptian priests, sitting in synod at Memphis, in honor of King Ptolemy V.

Hieroglyphs are representations on stone, wood, or papyrus, of objects or parts of objects, including heavenly bodies, human beings in various attitudes, parts of the human body, quadrupeds and parts of quadrupeds, birds and parts of birds, fishes, reptiles, etc., geometric and fantastic forms, amounting in all to about a thousand different symbols.

More than six hundred are ideographic (idea-writing); i. e., the engraved or painted figure, either directly or figuratively conveys an idea which we express by a word composed of alphabetic signs. Thus, directly, the figure of a man means "man;" figuratively the same figure means "power."

PHONETIC HIEROGLYPHICS

About one hundred and thirty of the hieroglyphs are phonetic (sound-conveying); i. e., represent words (which are nothing but sound with a meaning attached thereto) of which the first letter is to be taken as an alphabetic sign, and thus phonetic hieroglyphs answer the same end as our letters of the alphabet. For example: in ideographic writing, a bird, a mason, a nest, mean "birds build nests;" in phonetic hieroglyphic the figures of a *b*ull, *i*mp, *r*ope, *d*oor and *s*hip would give the word "birds," and the words "build" and "nests" would be expressed in the same round-about and clumsy fashion.

THE HISTORY OF EGYPT

From the old Greek writers and from records of the monuments we have a fairly complete story of this wonderful country and people.

FIRST MONARCH OF THE OLD KINGDOM

The first king of Egypt, Menes, whose date is set at 3400 years before Christ, is said to have founded the city of Memphis, near the site of the modern Cairo, which became the capital of Egypt; Thebes, in Upper (or Southern) Egypt, afterwards taking this position.

The building of the Great Pyramid at Gizeh, near Cairo, is ascribed to a king named Cheops (*kē'ops*)) by Herodotus, otherwise called Khufu (*kōō'fōō*), according to the hieroglyphic royal name found inside the structure. He is believed to have reigned about the twenty-eighth century before Christ. Cheops was the second and most celebrated monarch in the fourth of the dynasties which ruled at Memphis. The third king in this list, Khafra (*khaf'rä*) also founded a pyramid, as did the fourth, Menkaura (*men-kà-rä'*) or Nycerinus, a sovereign beloved and praised in poetry for his goodness. His mummified remains are in the British Museum. In the sixth dynasty was a female sovereign noted for her beauty, named Nitocris, who built a pyramid and reigned at Memphis. The monarchy then was for some time divided, the chief power being held by the kings ruling at Thebes, in Upper Egypt, who developed great power, and constructed many notable works.

THE INVASION AND RULE OF THE SHEPHERD-KINGS

About 1800 B. C. the Hyksos or Shepherd-kings, said to be of Arabian race, conquered Lower Egypt, and then subdued the kingdom of Thebes, ruling the whole land down to 1580 B. C. Probably to this period the story of Joseph in Egypt belongs. The shepherd-kings

were expelled with the aid of the Ethiopians from the south, and then came the great period of Egyptian history. During this time, Egypt was a great empire with Thebes for its capital. Under Thutmose III., Amenhotep III. and IV., and Seti I., Egypt rose to great heights of development and art.

GREAT EPOCH OF RAMESES II.

The greatest monarch of this, or perhaps of any, age of Egypt's history was Rameses the Great (called by the Greeks, Sesostris). To him have been attributed many of the monuments and pictures which represent triumphal processions and captives. Rameses the Great reigned for nearly seventy years in the fourteenth century before Christ. Among his many monuments two are chiefly remarkable, the Memnonium or palace-temple at Thebes, and the great rock-cut temple of Abu-Simbel in Nubia. These architectural works possess an interest more historical than that of the pyramids. He is said to have subdued Ethiopia, carried his arms beyond the Euphrates eastward, and among the Thracians in southeast Europe. The monumental sculptures and paintings tell us of war-galleys of Egypt in the Indian seas, and of Ethiopian tribute paid in ebony and ivory and gold, in apes and birds of prey, and even in giraffes from inner Africa. Other sculptures display the Egyptians fighting with success against Asiatic foes. To this monarch was due a vast system of irrigation by canals for conveying the waters of the Nile to every part of the country.

The next sovereign of note was Sheshanq (*Shi'shak*), who, in the latter part of the tenth century before Christ, took and plundered Jerusalem. The empire continued to decline, and was entirely reduced by Esarhaddon and Ashurbanipal, and became for a time tributary to the Assyrian monarchs. In the early part of the reign of the king Psametik I. (653-610 B. C.)

IMPORTANT REIGN OF PSAMETIK FOLLOWS AN AGE OF DECAY

We find Egypt in connection, for the first time in its history, with foreign countries, otherwise than as conquering or conquered. Psametik I. (653-610 B. C.) had in his pay a body of Greek mercenaries, and sought to introduce the Greek language among his subjects. In jealousy at this, the great military caste of Egypt emigrated into Ethiopia, and left the king dependent on his foreign troops, with whom he successfully warred in Syria and Phœnicia, and likewise succeeded in making Egypt independent of Assyria.

Neku, son of Psametik (610-595 B. C.), was an enterprising prince, who built fleets on the Red Sea and the Mediterranean, and strove to join the Nile, by a canal, with the Red Sea. Africa was circumnavigated by Phœnicians in his service, who sailed from the Arabian Gulf, and passed round by the Straits of Gibraltar to the mouths of the Nile. He was the king who defeated Josiah, king of Judah, sustaining afterward defeat from Nebuchadnezzar II., king of Babylon, at Carchemish.

In 590 B. C., came Apries (the Pharaoh-Hophra of Scripture), who conquered Sidon, and was an ally of Zedekiah, king of Judah, against Nebuchadnezzar. After being repulsed with severe loss in an attack on the Greek colony of Cyrene, west of Egypt, Apries was dethroned by Aahmes II., who reigned from 570 to 526 B. C. His prosperous rule was marked by a closer intercourse with the Greeks.

EGYPT IS CONQUERED BY PERSIA

Psametik III., son of Aahmes, inherited a quarrel of his father with Cambyses, king of Persia, who invaded and conquered Egypt in 525 B. C. For nearly two centuries afterwards the history of Egypt is marked, disastrously, by constant struggles between the people and their Persian conquerors, and, in a more favorable and interesting way, by the growing intercourse between the land of the Nile and the Greeks. Greek historians and philosophers—Herodotus and Anaxagoras and Plato—visited the country, and took back stores of information on its wonders, its culture, and its faith.

CONQUERED BY ALEXANDER THE GREAT AND PASSES UNDER GREEK RULE

In 332 B. C., Egypt was conquered by Alexander the Great; and its new capital, the great Alexandria, destined to a lasting literary and commercial renown, was founded. Subsequently it passed under Greek rule, and the language of the government, and the administration and philosophy, became essentially Greek. The court of the Ptolemies became the center of learning and philosophy; and Ptolemy Philadelphus, successful in his external wars, built the Museum, founded the library of Alexandria. He purchased the most valuable manuscripts, engaged the most celebrated professors, and had the Septuagint translation made of the Hebrew Scriptures, and the Egyptian history of Manetho drawn up. His successor, Euergetes, pushed the southern limits of his empire to Axum. Philopator (221-204 B. C.) warred with Antiochus, persecuted the Jews, and encouraged learning. Epphanes, (204-180 B. C.) encountered repeated rebellions and was succeeded by Philometor (180-145 B. C.) and Euergetes II. (145-116 B. C.), by Soter II. and Cleopatra till 106 B. C., and by Alexander (87 B. C.), under whom Thebes rebelled; then by Cleopatra, Berenice, Alexander II. (80 B. C.), and Neos Dionysus (51 B. C.) and finally by the famous Cleopatra who maintained her power only through her personal influence with Julius Cæsar and Mark Antony.

EGYPT BECOMES A ROMAN PROVINCE

On the defeat of Mark Antony by Augustus, B. C. 30, Egypt became a province of Rome. It was still a Greek state, and Alexandria was the chief seat of Greek learning and science. On the spread of Christianity the old Egyptian doctrines lost their sway. Now arose in Alexandria the Christian catechetical school, which produced Clemens and Origen. The sects of Gnostics united astrology and magic with religion. The school of Alexandrian Platonics produced Plotinus and Proclus. Monasteries were built all over Egypt; Christian monks took

the place of the pagan hermits, and the Bible was translated into Coptic.

PASSES UNDER MOHAMMEDAN RULE

On the division of the great Roman Empire (A. D. 395), in the time of Theodosius, into the Western and Eastern Empires, Egypt became a province of the latter, and sank deeper and deeper in barbarism and weakness. It was conquered in 640 A. D. by the Saracens under Caliph Omar. As a province of the caliphs it was under the government of the celebrated Abbasides—Haroun-al-Rashid and Al-Mamun—and that of the heroic Sultan Saladin. The last dynasty was, however, overthrown by the Mamelukes (1250); and the Mamelukes in their turn were conquered by the Turks (1516-17). The Mamelukes made repeated attempts to cast off the Turkish yoke, and had virtually done so by the end of the eighteenth century, when the French conquered Egypt and held it till 1801, when they were driven out by the British.

BECOMES A PAWN OF TURKEY, FRANCE AND ENGLAND

On the expulsion of the French a Turkish force under Mehemet Ali Bey took possession of the country. Mehemet Ali was made pasha, and being a man of great ability, administered the country vigorously and greatly extended the Egyptian territories. At length he broke with the Porte, and after gaining a decisive victory over the Ottoman troops in Syria in 1839 he was acknowledged by the sultan as viceroy of Egypt, with the right of succession in his family.

By the Anglo-French agreement of 1904 France formally recognized the predominant position of Great Britain, and agreed in no way to obstruct British action in the government of Egypt. The European War of 1914-1916 has again thrown Egypt into the balance, and its political future seems to be entirely a matter of the fortunes of war and diplomacy.

EGYPTIAN GOVERNMENT AND CIVILIZATION

At an early period the form of government in Egypt became an hereditary monarchy, of a peculiar kind. The power of the king was restricted by rigid law and antique custom, and by the extraordinary influence of the priestly class. The soil was held by the priests, the warriors, and the king.

Their Kings.—The Egyptian monarchs appear to have used their authority well and wisely; we rarely hear of insurrection or rebellion, and many received divine honors after death for their beneficence and regal virtues. The common title "Pharaoh" is derived from the Egyptian word "Phra," the sun.

Social Castes.—The body of the people were divided into castes, not rigidly separated, as in India. The members of the different orders might intermarry, and the children pass from one caste to another by change of the hereditary occupation. The castes were: (1) priests; (2) soldiers; (3) husbandmen; (4) artificers and tradesmen; (5) a miscellaneous class of herdsmen, fishermen and servants. The priests and warriors ranked far above the rest in dignity and privilege.

The Priests.—The hierarchy in Egypt was the highest order in power, influence and wealth. To the priestly caste, however, many persons belonged who were not engaged in religious offices. They were a landowning class, and the solely learned class. In their possession were all the literature and science of the country, and all employments dependent, for their practice, on that knowledge. The priesthood thus included the poets, historians, lawyers, physicians, and the magicians who did wonders before Moses. They paid no taxes, had large landed possessions, exercised immense influence over the minds of the people, and put no slight check even on the king.

Soldiers and Warriors.—Egypt had an army of over four hundred thousand men, mainly composed of a militia supported by a fixed portion of land (six acres per man), free from all taxation. The chariots and horses were famous: the foot-soldiers were variously armed with helmet, spear, coat of mail, shield, battle-axe, club, javelin and dagger, for close fighting in dense array; and with bows, arrows and slings for skirmishing and conflict in open order. The soldier was allowed to cultivate his own land when he was not under arms, but he could follow no other occupation.

The Lower Castes.—The castes below the warriors and priests had no political rights, and could not hold land; to-wit, The husbandmen who tilled the soil paid rent in produce to the king or to the priests who owned it; and the artisan class, which included masons and the usual tradesmen, whose occupations are recorded upon the monuments. The herdsmen were the lowest class, and of these the swineherds were treated as outcasts, not permitted to enter the temples, or to marry, except among themselves.

RELIGION OF THE EGYPTIANS

In Egypt, life was the thing sacred. Hence all that had life, all that produced and all that ended life, was in a way divine. Hence death, too, was sacred. The Egyptian lived in the contemplation of death. His coffin was made in his lifetime; his ancestors were embalmed. The sovereign's tomb was built to last for, not centuries, but thousands of years.

The highest form of the religious belief of the Egyptians included the idea that the soul was immortal. In the religion of Egypt were united the worship of Nature, and of the spirit which underlies and animates Nature.

The Egyptian Gods.—Having depended on the Nile and the Sun for the vegetation needed for their food, the people conceived human forms for them, and for the prolific Earth, as deities; namely, Osiris as the Nile and the Sun, and Isis as the Earth. These were the only divinities that were worshiped throughout Egypt. In later times they came to be regarded as divinities of the sun and the moon.

Another god, Anubis, worshiped in the form of a human being with the head of a dog, is represented as an Egyptian Hermes.

Whatever higher religious ideas may have been held by learned priests, the worship of the common people was chiefly adoration of

animals. The sacred bull, called Apis, was worshiped at Memphis with the highest honors. All Egypt rejoiced on his annual birthday festival, and there was a public mourning when he died. The dog, the hawk, the white ibis, and the cat, were also specially revered. The sparrow-hawk, with human head and outspread wings, denoted the soul flying through space, to animate a new body. Thus we find mingled, in the religion of Egypt, gross superstition in the masses of the people, along with the spiritual conceptions of cultivated minds.

The Future Life.—In a papyrus-book, discovered in the royal tombs of Thebes, called the Book of the Dead, we read in pictured writing of a second life, and of a Hall of Judgment, where the god Osiris sits, provided with a balance, a secretary, and forty-two attendant-judges. In the balance the soul is weighed against a statue of divine justice, placed in the other scale, which is guarded by the good Anubis. The assistant-judges give separate decisions, after the person on trial has pleaded his cause before them. The soul rejected as unworthy of the Egyptian heaven was believed to be driven off to some dark realm, to assume the form of a beast, in accordance with a low character and sensual nature. An acquitted soul joined the throng of the blest.

Embalming.—The religion of the people was connected with the practice of embalming the bodies of the dead. This art seems to have derived its origin from the idea that the preservation of the body was necessary for the return of the soul to the human form after it had completed its cycle of existence of three or ten thousand years. The art appears as old as 4000 B. C., at least, for the bodies of Cheops, Mycerinus, and others of the age of the fourth dynasty, were embalmed.

EGYPTIAN ARCHITECTURE AND SCULPTURE

The chief feature of Egyptian architecture is its colossal, massive grandeur, from the use of enormous blocks of masonry, and from the vast extent of the buildings, which produce in the beholder an unequalled impression of sublimity and awe. The approaches to the palaces and temples were paved roads, lined with obelisks and sphinxes; and the temples and the palaces themselves surpassed in size, and in elaborate ornament of sculpture and of painting, all other works of man.

The Pyramids.—Of about forty pyramids now left standing in Middle Egypt, the most remarkable are the group of nine at Gizeh, near the site of ancient Memphis. The removal of the vast blocks of stone from distant quarries, and their elevation to heights, which have sorely puzzled modern engineers, were effected, not by the ingenuity of mechanical contrivance, but by the lavish use of human labor. Thousands of men were employed for months in moving single stones.

The Temple Columns.—Egyptian columns were formed by their architects on the model of the palm-tree, whose feathery crown of foliage was ever before their eyes, or of the full-blown or budding papyrus. We find constantly in the mural decorations the figure of the famous lotus-plant, or lily of the Nile, beheld by the Egyptians with veneration, and used in sculpture and in painting as no mere ornament, but as a religious symbol. This water-lily of Egypt was consecrated to Isis and Osiris, and typified the creation of the world from water. It also symbolized the rise of the Nile and the return of the sun in his full power.

SCULPTURE AND PAINTING

Egyptian sculpture displays size, simplicity, stiffness, and little of what modern art calls taste or beauty. Neither did the Egyptians become true artists of the pictorial class. They used simple colors of brilliant hue; but of light and shade only little was known; and of perspective, nothing.

Their monuments prove, however, that they practiced the same mechanic arts, and used the same variety of tools, as the moderns. They were adepts at the finest work in every species of handicraft. We have here ample proof that the ancient Egyptians were a highly ingenious, artistic, tasteful, and industrious race.

CITIES AND HISTORIC MONUMENTS

The land of Egypt, teeming with population, abounded in cities and towns. Of these the greatest were Thebes, in Upper Egypt, and Memphis, in Middle Egypt, whose site was near the modern Cairo.

Abu-Simbel (*ä'bōō-sim'bel*) on the Nile, in Lower Nubia is the site of two very remarkable rockcut temples, among the most perfect and noble specimens of Egyptian architecture. Here there is no exterior and constructed part; the rock out of which they have been excavated rises too near the river. Still the temples have their façade, as richly decorated and as monumental in its character as those of the most sumptuous edifices of Thebes.

The colossal statues here, instead of being isolated monoliths, are a part of the façade itself, hewn out of the rock, though still forming part of it. The façade of the smaller temple, that of Hathor, is eighty-eight feet long and thirty-nine feet high. It has six colossal figures, about thirty-two feet high, of which four represent Rameses, and the other two his wife, Nefert-Ari. The façade of the great temple is larger, being one hundred and twenty-six feet long and ninety-three feet high.

Most striking are the four colossal figures of Rameses, two to the right, two to the left of the door. These are the largest figures of Egyptian sculpture, being sixty-six feet high. Everywhere are pictures like those at Luxor and Karnak, representing the battles and triumphs of Rameses.

Abydos (*a-bī'dos*), next to Thebes the most important city in the ancient kingdom of Upper Egypt. Here was found, 1817, in a corridor of the temple of Seti I. a very important tablet giving a succession of sixty-five kings beginning with Menes, covering a period of about 2,200 years. A similar tablet containing eighteen names, found in the temple of Rameses in 1818, was removed by the French consul-general, sent to Paris, and finally purchased for the British Museum.

Alexandria, the third capital of Egypt, was founded by Alexander the Great in the autumn of the year 332 B. C. It was situated originally on the low tract of land which separates the lake Marcotis from the Mediterranean, about fourteen miles west of the Canopic mouth of the Nile. Before the city, in the Mediterranean, lay an island, upon which stood the famous

lighthouse, the Pharos, built in the time of Ptolemy I. in the third century B. C., and said to have been four hundred feet high. The island was connected with the mainland by a mole, thus forming the two harbors.

The most magnificent quarter of the city, called the Brucheion, contained the palaces of the Ptolemies, the Museum, for centuries the focus of the intellectual life of the world, and the famous library; the mausoleum of Alexander the Great and of the Ptolemies, the temple of Poseidon, and the great theater.

To the south was the beautiful gymnasium. The Serapeum, or temple of Serapis, stood in the Egyptian quarter.

Much of the space under the houses was occupied by vaulted subterranean cisterns, which were capable of containing a sufficient quantity of water to supply the whole population of the city for a year.

From the time of its foundation, Alexandria was the Greek capital of Egypt. Its population in the time of its prosperity, amounted to about three hundred thousand free citizens, and probably a larger number of slaves. This population consisted mostly of Greeks, Jews and Egyptians, together with settlers from all nations of the known world.

After the death of Alexander the Great, Alexandria became the residence of the Ptolemies. They made it, next to Rome and Antioch, the most magnificent city of antiquity, as well as the chief seat of Greek learning and literature.

Alexandria had reached its greatest splendor when, on the death of Cleopatra, the last of the Ptolemies, in 30 B. C., it came into the possession of the Romans. Its glory was long unaffected, and it was the emporium of the world's commerce.

In the reign of Caracalla, however, it suffered severely. The strife between Christianity and heathenism in the third century—powerfully described in Kingsley's Hypatia—gave rise to bloody contests in Alexandria. The rise of Constantinople only served to hasten its fall. The choice of Cairo as capital of the Egyptian caliphs hastened the now rapid decay of the city; the discovery of America, and of the passage to India by the Cape of Good Hope, very much diminished its trade; and when, in 1517, the Turks took the place, the remains of its former splendor wholly vanished.

Under Mehemet Ali, however, the tide turned, and the city recovered rapidly. It is now again one of the most important commercial places on the Mediterranean with a population of about three hundred and fifty thousand. The Suez Canal diverted part of its trade; but this was more than compensated by the general impetus given to Egyptian prosperity.

Of the few remaining objects of antiquity the most prominent is Pompey's Pillar, as it is erroneously called. Of the so-called Cleopatra's Needles—two obelisks of the sixteenth century B. C. which long stood here—one was taken to England and erected on the Thames Embankment, London, 1878; and the other, presented by the khedive to the United States, was set up at New York in 1881.

Assuan or **Assouan** (*ăs-swän*), the ancient Syene is the southernmost city of Egypt proper, on the right bank of the Nile, and beside the first or lowest cataract. It is noted for its granite, and was the place of banishment of Juvenal, the Roman poet. Here also is the great Nile irrigation system, begun in 1898, including a dam at Assuan and another at Assiout (two hundred and fifty miles nearer Cairo). The Assuan dam, finished in 1902 was designed to raise the level of the Nile for one hundred and forty miles above the first cataract. Its total length is one and one-quarter miles, the maximum height from the foundation about one hundred and thirty feet and the total weight of masonry over one million tons.

The difference of level of the water above and below is sixty-seven feet, and navigation is provided for by a series of four locks, each two hundred and sixty feet by thirty-two feet. The dam is pierced with one hundred and eighty openings, twenty feet by six feet, capable of discharging fifteen thousand tons of water per second. The reservoir, when opened, held something over one thousand million tons of water.

In 1907 the level was raised by twenty-three feet, steps being taken to preserve (as far as is consistent with partial submersion) the ruins of the temples on the island of Philæ within the area of the dam. Barrages at Zifteh and at Esneh help to regulate the flow.

Cairo (*kī′rō*).—The present capital of Egypt, is situated one mile east of the Nile. It has important transit trade, and is the starting-point for tours to neighboring pyramids, the sites of Memphis and Heliopolis, and the upper Nile. Its chief suburb is Bulak. It was founded by the Fatimite caliphs about 970, and made the capital. It was taken by the Turks in 1517, was held by the French 1798-1801, and was occupied by the British in 1882. It was the scene of the massacre of the Mamelukes in 1811.

There are about four hundred Mosques, some having six minarets, and adorned with beautiful granite columns, brought from Heliopolis and Memphis. About twenty deserve notice as works of art. The largest mosque is El Azhar, at the center of the city, regarded as a University for all Islam. The next in size is that of Sultan Hasan, in the Roumeyleh square, the finest structure in modern Egypt, and extremely light and elegant. It is built in the form of a parallelogram, and has a deep frieze running round all the wall, adorned with Gothic and Arabesque sculpture.

Other noticeable Mosques are the Tomb-Mosque of Kait Bey, built about 1470, one of the finest pieces of architecture in Cairo; and the Mosque of Amra, the oldest mosque in Egypt (founded 643 A. D.), and a remarkable Mohammedan monument.

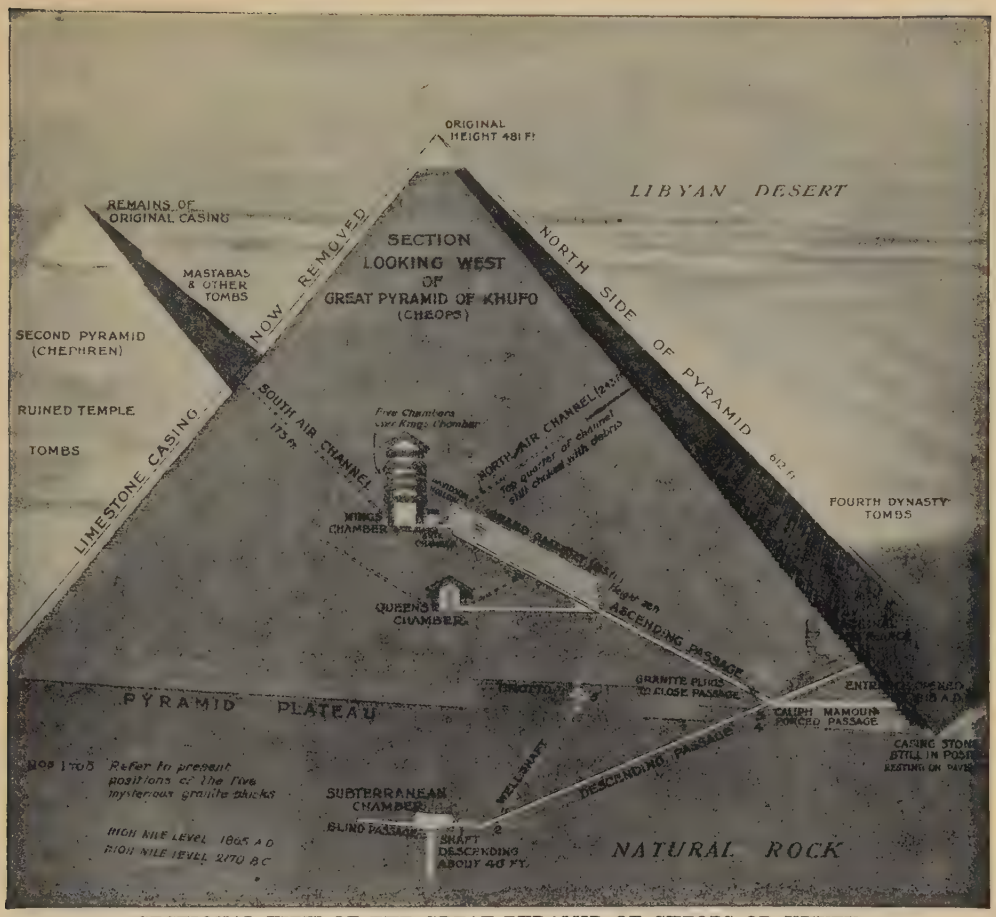
The Citadel, or fortified Palace, erected by Saladin in 1176, was the only place of defence in the city; it fell into ruin, but was thoroughly repaired by a late pasha. Formerly it included a magnificent hall, Saladin's Hall, environed with twelve columns of granite, of prodigious height and thickness, brought from the ruins of Alexandria. These supported an open dome, under which Saladin distributed justice to his subjects.

The view embraces the city, and above thirty miles along the Nile, including the ruins of Old Cairo, site of Memphis, great Pyramids, Obelisk of Heliopolis, and Pyramids of Sakkara. The Khedive resides at the Abdin and Kubbeh Palaces.

The street scenes of Cairo are of inexhaustible interest and amusement; civilization and semi-barbarism constantly jostle, the garb of the east perpetually comparing, in the season, with the toilettes of London, Berlin and Paris; refinement and coarseness, culture and ignorance, Mohammedanism, paganism, Christianity, every tint of skin, all conceivable phases of existence, present themselves in the throng of a Cairo street.

Gizeh or **Ghizeh** (*gē′ze*) is situated on the Nile about three miles west-southwest of Cairo. The Gizeh group consists of the Great Pyramid, the second and third pyramids, and eight small pyramids.

THE GREAT PYRAMIDS is the tomb of the Pharaoh Khufu (Cheops,) of the fourth dynasty. Its original height was four hundred and eighty-one feet (present height, four hundred and fifty-one), and the original length of the sides at the base, seven hundred and fifty-five. It is built of solid



SECTIONAL VIEW OF THE GREAT PYRAMID OF CHEOPS OR KHUFU

This cross-section clearly exhibits the known passages within the seven million ton monument, which for six thousand years has stood to commemorate Cheops (See page 350).

masonry in large blocks, closely fitted, with use of mortar. The exterior forms a series of steps, which were originally filled with blocks of limestone accurately cut to form a smooth slope. The entrance, originally concealed, is on the north side, forty-five feet above the base and twenty-four feet to one side of the center. The passage slants downward for three hundred and six feet; but the corridor, slanting upward to the true sepulchral chambers, soon branches off from it. A horizontal branch leads to the queen's chamber, about eighteen feet square, in the center of the pyramid, and the slanting corridor continues in the Great Gallery, one hundred and fifty-one feet long, twenty-eight feet high, and seven feet wide, to the vestibule of the king's chamber, which is thirty-four and one-half feet long, and seventeen feet wide, and nineteen feet high, and one hundred and forty-one feet above the base of the pyramid. It contains a plain, empty sarcophagus.

THE SECOND PYRAMID, or pyramid of Chephren (Khafra), was originally four hundred and seventy two feet high and seven hundred and six feet in in base-measurement. It has two entrances, and interior passages and chambers similar to those of the Great Pyramid. It retains at the top, part of its smooth exterior casing.

THE THIRD PYRAMID, that of Menkaura, was two hundred and fifteen feet high, and three hundred and forty-six feet to a side at the base. The entrance-passages and sepulchral chambers are similar to those of the other pyramids. All three were built by the fourth dynasty. Temples, now ruined, stand before the eastern faces of the second and third pyramids.

SPHINX (*sfingks*).—This celebrated figure is a quarter of a mile southeast of the Great Pyramid. According to present opinion, it is older than any of the pyramids. It consists of an enormous figure of a crouching sphinx of the usual Eyyptian type, hewn from the natural rock, with the flaws and cavities filled in with masonry. The body is one hundred and forty feet long; the head measures about thirty feet from the top of the forehead to the chin, and is fourteen feet wide. Except the head and shoulders, the figure has for ages generally been buried in the desert sand.

Between the paws were found an altar, a crouching lion with fragments of others, and three large inscribed tablets, one, fourteen feet high, against the Sphinx's breast, and the two others extending from it on each side, thus forming a sort of shrine. The Sphinx was a local personification of the sun-god.

Heliopolis (*hē-li-op'ō-lis*) the City of the Sun, or On—the oldest, perhaps, in this land of antiquities—was a sort of sacerdotal and university town, where Herodotus sought the wisest men in Egypt. Here Plato is said to have graduated.

Here also lived Potiphar, who bought Joseph the patriarch. It consisted for the most part of temples and colleges; of which nothing now remains but a few isolated mounds, and one extremely ancient Obelisk. At the village of Metariyeh is reputed to be the place where the Virgin, St. Joseph and the infant Jesus stopped, under a sycamore.

Memphis (*mĕm'fis*) after the fall of Thebes, became the capital of Egypt, and kept its importance till the conquest by Cambyses. It was built by Menes on the western bank of the Nile, south of Cairo. It suffered from the Hyksos, and was captured by the Assyrians and stormed by Cambyses. It continued to exist under the Roman Empire, but was gradually abandoned and ruined after the Mohammedan conquest in the seventh century A. D. The ruins of Sakkara are near it. The desert sands have overwhelmed its famous avenue of sphinxes; and the great Pyramids of Gizeh, and the colossal Sphinx, are the chief memorials of the past in its vicinity.

Although various opinions have prevailed as to their use, the Pyramids were really nothing more than the tombs of monarchs of Egypt who flourished from the first to the twelfth dynasty. With the exception of some very late pyramids in Nubia, none were constructed after the twelfth dynasty, the later kings were buried at Abydos, Thebes, and other places, in tombs of a totally different construction.

Thebes (*thēbz*) is the No or No Ammon of Scripture, and is situated on the Nile opposite Karnak and Luxor. It was at the height of its splendor, as capital of Egypt from about 1600 to 1100 B. C. Its vastness is shown by the existing remains, known (from the names of modern villages) as the ruins of Karnak, Luxor, etc. They consist of obelisks, sphinxes, colossal statues, temples, and tombs cut in the rock,—mighty monuments, with their countless sculptured details and inscriptions, themselves the historians of the Egyptian Empire of three thousand years ago. It was enriched by the spoils of Asia and the tributes of Ethiopia, and its fame and reputation had reached the early Greeks. At the Persian conquest in the sixth century B. C. Cambyses destroyed many of its noblest monuments.

At the present day the glory of Thebes consists in its ancient temples. Of these the best known are the El Kurna, the Rameseum and Medinet-Abu temples, founded by Seti I., Rameses II., and Rameses III. respectively. To Amenhotep III. are ascribed two temples on the west side of the city, as also the well-known temple at Luxor.

LUXOR (*luk'sor*).—The present front of the latter temple was preceded, at the end of a great dromos of sphinxes leading to Karnak, by two beautiful obelisks of red granite, one of which still remains, and the other stands in the Place de la Concorde, Paris.

Before the large double gateway of the court are two colossal seated statues. The court is surrounded by a double range of columns. Beyond, the avenue to the buildings of Amenhotep makes a sharp angle and meets the gateway of the court, which is surrounded by a double colonnade. The buildings behind the court contain a great number of chambers and an isolated sanctuary, all profusely sculptured and colored.

KARNAK (*kär'nak*).—The temple here originally founded in the twelfth dynasty, owes much of its magnificence to later kings. The Great Temple extends to a length of about twelve hundred feet from west to east, and is comparatively regular in plan. The double gateway of the great court is about three hundred and seventy feet wide; the court is colonnaded at the sides, and has an avenue of columns in the middle.

A second gateway follows, and opens on the famous hall, one hundred and seventy by three hundred and twenty-nine feet, with central avenue of twelve columns sixty-two feet high and eleven and one-half feet in diameter, and one hundred and twenty-two columns forty-two and one-half feet high at the sides. A narrow court follows, ornamented with figures and containing two obelisks.

Behind this building is another large open court, at the back of which stands the edifice of Thothmes III., an extensive building containing a large hall and many comparatively small halls and chambers.

The mural sculptures are vast in quantity, and highly interesting in character, particularly those which portray the racial characteristics of various conquered Asiatic peoples.

Suez (*sōō-ez'*).—A seaport of Egypt, situated at the head of the Gulf of Suez, is best known as the southern terminus of the Suez Canal. It was the ancient Arsinoë and the terminus of an ancient canal built by the Egyptian king, Rameses II., between the Nile delta and the Red Sea. This, having been allowed to fill up and become disused, was reopened by Darius I. of Persia. It was once more cleared and made serviceable for the passage of boats by Arab conquerors of Egypt.

In 1841 the French diplomat Lesseps set himself to study the isthmus of Suez thoroughly, and in 1854 he managed to enlist the interest of Said Pasha, khedive of Egypt, in his scheme for connecting the Mediterranean with the Red Sea.

Two years later the Porte granted its permission and the Universal Company of the Maritime Suez Canal was formed, receiving important concessions from the ruler of Egypt. The work was begun in 1859, and in 1869, the canal was duly opened for vessels. Between 1885 and 1889 the canal was enlarged and improved, and altogether over one hundred million dollars were spent in its construction. The total length is one hundred miles; the width of the water-surface was at first one hundred and fifty to three hundred feet, the width at the bottom seventy-two feet, and the minimum depth twenty-six feet. At Port Said two strong breakwaters, six thousand nine hundred and forty and six thousand and twenty feet long respectively, were run out into the Mediterranean; at Suez another substantial mole was constructed.

The making of the canal was facilitated by the existence of three or four valleys or depressions (formerly lakes), which, when the water reached them, became converted into lakes. Immediately south of Port Said the canal crosses Lake Menzaleh (twenty-eight miles long); and three more—Lake Ballah, Lake Timsah (five miles long), and the Bitter Lakes (twenty-three miles) are traversed to the south of it. The highest point or elevation that was cut through does not exceed fifty feet above sea-level. At intervals of five or six miles sidings or side-basins are provided to enable vessels to pass one another. By 1890 the canal had been deepened to twenty-eight feet, and widened between Port Said and the Bitter Lakes to one hundred and forty-four feet, and from the Bitter Lakes to Suez to two hundred and thirteen feet.

In 1875 Lord Beaconsfield, Prime Minister of England bought for the British Government the khedive's shares—nearly half the canal stock—for $20,500,000. They are now valued at about $150,000,000, and bring in over $5,000,000 annual revenue.

From Suez there is a tourist route to Mount Sinai, near the coast, under the range called Jebel-et-Tih past Elim, Paraoh's Quarries, and Rephidim. The Sinai District comprises Mount Horeb, the Valley of Jethro, Church of the Burning Bush, Chapel of Elijah, and other historical sites. Thence it leads to Akabah, and up the deep pass of Wady Moosa, to Mount Hor (or Petra), Zoar, and Mount Seir, Beersheba and Hebron. (See Holy Land).

GREAT ASSYRIAN MONARCH, ASHURBANIPAL, AS A LION HUNTER

This famous conqueror was one of the most enlightened of Assyrian rulers. He encouraged literature, and through his wise counsels the annals of Babylonia and Assyria, written on clay tablets, have been preserved for us in the library of his palace. From these we have learned practically all we know of Babylonian-Assyrian history and religion.

BABYLONIA—ASSYRIA

IN the very first ages of the world, Babylonia, with Egypt, led the way as the pioneers of mankind in the arts of civilization. Alphabetic writing, astronomy, history, chronology, architecture, plastic art, sculpture, navigation, agriculture, textile industry, all had their origin in one or other of these two countries.

GEOGRAPHY AND PHYSICAL FEATURES OF THE REGION

The ancient kingdom of Babylonia was bounded on the east by Elam or Susiana; on the south by the Persian Gulf; on the west by the deserts of Arabia; and on the north by Assyria. It was watered by two streams, the Tigris and the Euphrates, and it was intersected by a number of canals, branching out from these great rivers, and dug in order to save the country from the effects of the annual inundations.

From the head waters of the Tigris and Euphrates to the Persian Gulf is a distance of about eight hundred miles. The land included between the two rivers divides itself naturally into two parts. The northern one of these, Assyria, is a great plain of limestone and selenite, in area almost equal to England. The northern and western portions of this plain are broken by mountains and are of a fertile character, as is also that part of Assyria which lies east of the Tigris.

The southern of the two principal parts, Babylonia, is of alluvial character, and in ancient times was about equal in area to the combined territory of Holland and Belgium or to the southern half of Louisiana, the latter a region to which it has been likened in character. On the east of the Tigris, the Babylonian plain stretches away for a distance of some thirty to fifty miles, to the mountains of Elam. On the west it merges into the Arabian desert, twenty or thirty miles from the Euphrates, where the low hills check the overflow of the river.

EARLY DIVISIONS AND FAMOUS CITIES OF BABYLONIA

Babylonia appears to have been divided into the two large provinces of

Sumer or Shinar (South Babylonia), and Accad or north Babylonia. The capital of this latter province was, like Babylon, built on both banks of the Euphrates, the larger half being called Sippara of Samas, the sungod (the modern Abu Habba), and the smaller half Accad or Agade. The latter was afterwards named "Sippara of the moon-goddess." The greater part of Babylonia is now included in the modern Turkish province of Bagdad.

Ancient Babylonia also contained a number of other large cities and there was a succession of famous capitals: Babylon, of the Babylonian Empire, and afterwards of the Persian; Seleucia, founded by Seleucus, king of Syria, after the death of Alexander the Great; Ctesiphon, capital of the Parthian Empire; in modern times, Bagdad.

Babylon, on the Euphrates, is first mentioned in a tablet of 3800 B. C. From 2250 B. C. it became the capital of Babylonia and the holy city of western Asia. The name Babylonia is the Greek form of Babel, meaning "The Gate of the God." Its Persian name was Babirus. It was according to the accounts of Greek writers, the greatest city of antiquity.

Nebuchadnezzar, who took more pride in the buildings constructed under his auspices than in his victorious campaigns, concentrated all his care upon the adorning and beautifying the city. To this end he completed the fortification of the city begun by his father Nabopolassar, consisting in a double inclosure of mighty walls which were strengthened by two hundred and fifty towers and pierced by one hundred gates of brass. The city itself was adorned with numerous temples, chief among them Esagila ("the high-towering house"), temple of the city and of the national god Merodach (Babylonian *Marduk*) with his spouse Zirpanit. In the neighborhood of it was the royal palace, the site of which was identified with the ruins of Al-Kasr. Sloping toward the river were the Hanging Gardens, one of the seven wonders, the location of which is in the northern mound of ruins, Babel.

THE TOWER OF BABEL, which is supposed to be the temple of Nebo in Borsippa, not far from Babylon, represents the most imposing ruin of Babylonia. It is termed in the inscriptions *Ezida* ("the eternal house"), an ancient sanctuary of Nebo, and was restored with great splendor by Nebuchadnezzar. It represents in its construction a sort of pyramid built in seven stages, whence it is sometimes called "temple of the seven spheres of heaven and earth," and it is assumed that the narrative of the "Tower of Babel" which the builders intended to carry up to heaven, was connected with this temple.

In the conquest of Cyrus, 538 B. C., the city of Babylon was spared. Darius Hystaspis razed its walls and towers. Xerxes (486-465 B. C.) despoiled the temples of their golden statues and treasures. Alexander the Great wished to restore the city, but was prevented by his early death. The decay of Babylon was hastened by the foundation in its neighborhood of Selencia, 300 B. C., which was built from the ruins of Babylon. The last who calls himself in an inscription "King of Babylon" was Antiochus the Great (223-187 B. C.)

EARLY HISTORY RIVALS THAT OF EGYPT

It is now evident, from the monuments and inscriptions which have been obtained from the traditionally oldest cities, that the civilization of the ancient people of Babylonia has an antiquity rivaling that of ancient Egypt. The American discoveries at Nippur in 1888-90 carry back Babylonian civilization to about 7000 B. C.

The early struggles for supremacy among the city states seem to have been confined to the lower valley of the Tigris and Euphrates; but about 4000 B. C. a mighty conqueror, Lugalzaggisi of Uruk, made expeditions to the Mediterranean and to the mountains at the north of Mesopotamia. He styled himself "King of Uruk," "King of the Totality."

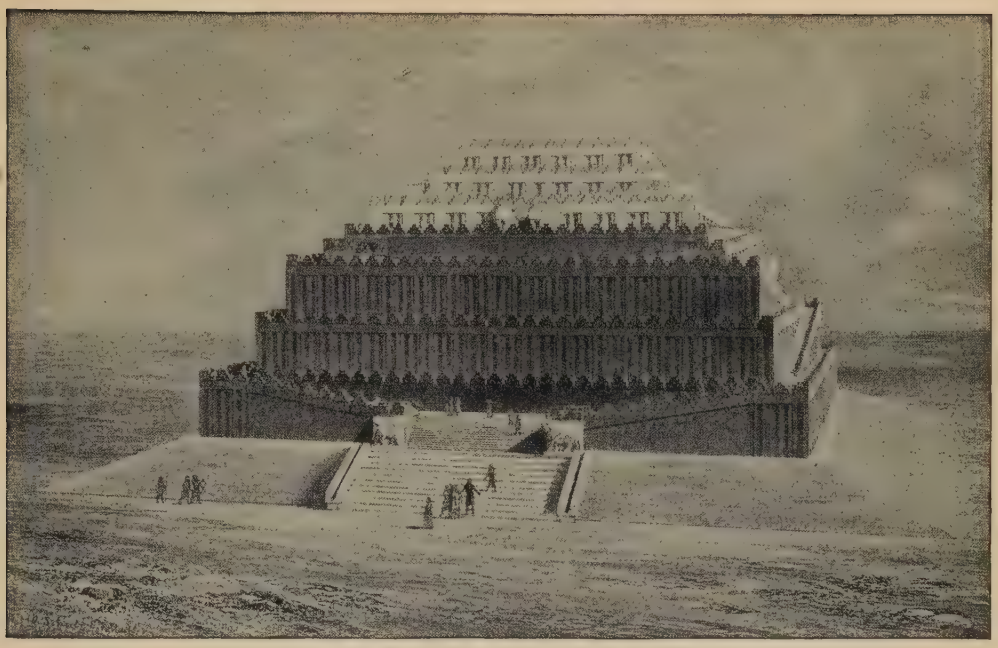
Very early, however, a Semitic invasion must have taken place, for the date of two Semitic kings, namely, Sargon I. and Naram-Sin, of Accad, is placed, according to the testimony of the later Babylonians themselves, at about B. C. 3800 and 3750 respectively. Gudea, the priest-king, and a famous builder, was the chief ruler about 2800 B. C.

GREAT PERIOD OF HAMMURABI

About B. C. 2250 Hammurabi sat upon the throne of Babylon, the name of which now first appears in cuneiform records, although it may have been founded centuries before. This great monarch, Hammurabi, has left records of his enlightened efforts for the agricultural development of the land, and a great law code, cut in the enduring rock, which carries our knowledge of the history of law back a thousand years before the age of Moses. As yet no inscription has been discovered giving the details of his wars; but it is evident that he destroyed the Elamite power in Babylonia, and his assumption of the ancient titles "King of Sumer and Accad," "King of the Four Quarters of the World," seems to indicate that his power extended far. In Larsa and Sippar he erected temples to the sun-god, and at Babylon and Borsippa he enlarged those already standing. His great canal running down through the heart of Babylonia made the bordering territory fertile; and the granary built at Babylon stored the increased crops of grain. It may be that Lugalzaggisi and Sargon I. exceeded Hammurabi in the extent of their sway, but Hammurabi made Babylon the center of culture for southwestern Asia during millenniums.

After him we know little of the history until Burnaburiash, a Hassite king who was on the throne about 1400 B. C., exchanged letters with Amenhotep III. of Egypt as recorded in the Tel-el-Amarna Letters.

About 1250 B. C. Babylonia was conquered by Assyria, and, though it soon regained its independence and was again ruled by native kings, it remained a politically subordinate power, and was repeatedly conquered by its more powerful neighbor, until the fall of Nineveh, consequently we must now consider Assyria, as the successor of the *first* Babylonian Empire, and go back a little into its history up to the time of Tiglath Pileser I., the conqueror of old Babylon.



THE TOWER OF BABEL RESTORED

This model of the famous "tower that reached to Heaven" was constructed by Sir Henry Rawlinson after years of study and exploration. The drawing, by O. Schulz, is now in the United States National Museum at Washington, D. C.

II. THE ASSYRIAN EMPIRE

Assyria proper, as heretofore stated, was a table-land, bounded on the north by part of Armenia; on the east by that part of Media which lies towards Mt. Zagros; on the south by Elam or Susiana and part of Babylonia; and on the west by the river Tigris, or later by the Chaboras, a branch of the Euphrates. The greater part of the ancient kingdom of Assyria is now contained in the modern province of Kurdistan. In size it may be compared to Great Britain.

DIVISIONS AND CITIES OF ASSYRIA

It was divided into seven provinces, and contained many great cities, of which the chief after Nineveh, the capital, were Asshur, which alone stood on the west bank of the Tigris, Calah, Dur-Sargon, Arbela, Tarbisi. The ruins of many cities are grouped around Nineveh; while lower down the Tigris is exhibited an almost unbroken line of ruins from Tekrit to Bagdad.

Nineveh was situated on the eastern bank of the upper Tigris opposite the modern Mosul, two hundred and thirty miles northwest of Bagdad. The ruins of the original capital, Asshur, now called Kalah Sherghat, are some sixty miles south. Nineveh, Calah (Nimrud), and Dur-Sargon (Khorsabad), ultimately supplanted it in importance. When Nineveh itself fell, the whole Assyrian empire—essentially a military power—perished with it. It was not until the excavations of Botta in 1842 and Layard in 1845 that the remains, first of Dur-Sargon, then of Nineveh itself, were revealed to the world.

As a result of these excavations, the general outline of the city, the remains of four palaces and numerous sculptures, and thousands of tablets (principally from the so-called library of Ashurbanipal) were discovered. The greater part of these is now in the British museum. The city had a circumference of from seven to eight miles, the ruins of the walls showing a height in some parts of fifty feet. Shalmaneser I. built a palace at Nineveh and made it the city of his residence. Samsi-ramman III. decorated and restored the temple of Ishtar, famous for a special phase of the cult of the goddess. For a time Nineveh was neglected, but Sennacherib (705-681 B. C.), was a special patron of Nineveh. He surrounded it with a wall, replaced the small palace at the northeast wall by a large one, built another palace which he filled with cedar wood and adorned with colossal bulls and lions, and beautified the city with a park. Esarhaddon finished a temple, widened the streets, and beautified the city, forcing the kings whom he conquered to furnish materials for adorning the city and palaces. Nineveh succumbed to the combined attack of the Medes under Cyaxares and the Babylonians under Nabopolassar in 608 B. C.

In its times of prosperity, Assyria extended its borders on every side; and the Greeks and Romans often included the whole of Syria and of the regions watered by the Euphrates and the Tigris under the name.

Assyria and the neighboring provinces were celebrated for their great fertility; they were the original home of wheat and barley, and the date-palm grew there to perfection. The irrigation of the crops was ensured by the annual overflow of the Tigris.

EARLY ASSYRIAN HISTORY SHOWN BY THE INSCRIPTIONS

The Assyrian kingdom first began to be powerful about 1350. Shalmaneser I. had be-

come so powerful that he invaded and captured Babylon about 1250 B. C. His descendant in the direct line of kings was Tiglath-Pileser I., about 1100 B. C., the real founder of the first Assyrian empire, whose reign forms the zenith of the early empire. He spread the dominion of Assyria over all western Asia, from the frontiers of Elam to the shores of the Mediterranean, and from the slopes of the mountains of Armenia to the shores of the Persian Gulf. He captured Babylon, Sippara, and reduced Babylonia to the position of a tributary state. On the west he advanced as far as Khilikhi (Cilicia), defeated the Hittites, captured their stronghold Carchemish, and received the homage of the people of Arvad and the cities of northern Phœnicia.

SECOND IMPORTANT DYNASTY ESTABLISHED

In 960 B. C. a new dynasty was founded by Assur-dân II., whose son Rimmon-nirari II., and great-grandson Asshur-nasirpal, by a long series of cruel wars once again extended the power of Assyria. The extensive trade carried on by Phœnician merchants in Assyria at this time is largely illustrated by the Phœnician bronzes and ivories disinterred in the palace of Asshur-nasirpal at Nimrud.

His son, Shalmaneser II., was successful in war against the monarch of Babylon, Benhadad, king of Damascus, the rulers of Tyre and Sidon, and Jehu, king of Israel. In 745 B. C., Tiglath-Pileser II. became king of Assyria, made himself master of Babylon, and had great successes in war against Syria and Armenia, extending the empire greatly.

REIGN OF SARGON THE ASSYRIAN

Sargon (722-705 B. C.) was engaged in war against Samaria, which he captured, carrying the people into captivity; against King Sabako of Egypt, whom he defeated; and the revolted Armenians, whom he thoroughly subdued. He then turned against Merodach-Baladan, king of Babylonia, and drove him from his throne, and, after extensive internal reforms, was succeeded by his son, the famous Sennacherib.

ASSYRIA BEGINS PERIOD OF GREATEST SPLENDOR

This warlike monarch marched into Syria in 701 B. C., captured Sidon and Askelon, defeated the forces of Hezekiah, king of Judah, with his Egyptian and Ethiopian allies, and made Hezekiah pay tribute. In 700 B. C. Sennacherib marched into Arabia, there defeated Tirhakah, king of Egypt and Ethiopia, and then his army perished before Libnah, in the south of Judah, by the catastrophe recorded in the Hebrew Scriptures. Sennacherib was engaged, on his return to Assyria, in crushing rebellions of the Babylonians, constructing canals and aqueducts, and greatly adding to the size and splendor of Nineveh.

In 681 he was murdered by two of his sons, and another son, Esarhaddon, became king in 680. Esarhaddon made successful expeditions into Syria, Arabia, Egypt, and as far as the Caucasus Mountains, and after the erection of splendid buildings at Nimrud and other cities, was succeeded in 668 by his son Asshur-banipal (the origin of the Greek "Sardanapalus").

GREAT EXTENT OF THE EMPIRE AT ITS HEIGHT

The Assyrian Empire was at its height of power under the kings Sennacherib, Esarhaddon, and Asshurbanipal. The states nominally subject to the Assyrian king, paying tribute and homage, extended from the river Halys, in Asia Minor, and the seaboard of Syria, on the west, to the Persian Desert on the east; and from the Caspian and the Armenian Mountains, on the north, to Arabia and the Persian Gulf, on the south; and latterly included Egypt.

DECLINE AND FALL OF THE EMPIRE

Ashurbanipal inherited Egypt as part of his dominions, but his power was not firmly established in that country until he led an expedition there, and sacked the city of Thebes. He erected splendid buildings at Nineveh and Babylon, and did much for literature and the arts; so that under him there was a great development of luxury and splendor. He died in 625 B. C.; and soon afterwards Babylonia, for the last time, and with success, revolted. The Babylonians marched from the south against Nineveh, under their governor Nabopolassar; and the now powerful Medes, from the north, came against it under their king, Cyaxares. Nineveh was taken and given to the flames, which have left behind them in the mounds the calcined stone, charred wood, and statues split by the heat, that furnish silent and convincing proof of the catastrophe. Thus, about 625 B C., warlike, splendid, proud Assyria fell, after which it became a Median province.

III. LATER BABYLONIAN EMPIRE

The founder of the later Babylonian Empire (625 B. C. and ending 538, with its subjection to Persia) was Nabopolassar, who joined the Medes in the destruction of the Assyrian power. Babylon then became an independent kingdom, extending from the valley of the Lower Euphrates to Mount Taurus, and partly over Syria, Phœnicia, and Palestine.

THE FAMOUS REIGN OF NEBUCHADNEZZAR

Nabopolassar was succeeded by his son, the famous Nebuchadnezzar (604 to 561 C. B.), who carried his arms with success against the cities of Jerusalem and Tyre, and even into Egypt. The empire was at its height of power and glory under him, and extended from the Euphrates to Egypt, and from the deserts of Arabia on the south to the Armenian Mountains on the north.

The carrying into captivity of the Jews by Nebuchadnezzar and the pride of his heart,—his image of gold in the plain of Dura, his fiery furnace, his strange madness, recovery, and repentance,—are well known from the account in the Hebrew Scriptures by the prophet Daniel.

Nebuchadnezzar was succeeded by his son Evil-Merodach, the friend of Jehoiachin, captive King of Judah. He was followed by Neriglassar, a successful conspirator against his power and life; and he in turn, after some years, was defeated and slain in battle against the Medes and Persians. The assassination, after a few months, of the tyrant Laborosoarchod brought the last Babylonian monarch, Nabonidus, to the throne, in 555 B. C.

FALL OF BABYLON UNDER BELSHAZZAR

The Medes and Persians to the north had now become a formidable power, and in 540 the Persian king, Cyrus, marched against Babylon, and under its walls defeated Nabonidus, who fled to Borsippa, south of Babylon. The capital was held by a son of Nabonidus, who had been made co-king with his father,—Belshazzar. The revelries of this sovereign during the siege, the handwriting on the wall, and his death the same night, are given in the scriptural narrative of Daniel. The Babylonian Empire fell in 538 B. C., and became a province of the Persian Empire. The site of the great city of Babylon is now a marsh, formed by inundations of the river, due to the destruction of the embankments and the choking up of the canals.

IV. CIVILIZATION IN BABYLONIA AND ASSYRIA

COMMERCE AND MANUFACTURES.—The Babylonians were a commercial and luxurious people; the Assyrians were pre-eminently warlike. The position of the great city of Babylon on the Lower Euphrates, near to the Persian Gulf, made it a great emporium for the trade between India and eastern Asia and western Asia, with the nearest parts of Africa and Europe. From Ceylon came ivory, cinnamon and ebony; spices from the eastern islands; myrrh and frankincense from Arabia; cotton, pearls, and valuable timber, both for ship-building and ornament, from the islands in the Persian Gulf. There was also a great caravan trade with northern India and adjacent lands, whence came gold, dyes, jewels, and fine wool.

MANUFACTURES.—The wealth of Babylon became prodigious and proverbial, and her commerce was, in large measure, due to ingenious and splendid manufactures. Carpets, curtains, and fine muslins, skilfully woven and brilliantly dyed, of elegant pattern and varied hue, were famous wherever luxury was known. The Babylonian gems in the British Museum display art of the highest order in cutting precious stones.

GOVERNMENT AND LEARNING.—The system of government was a pure despotism, with viceroys ruling the provinces under the monarch, who dwelt in luxurious seclusion from his people. The priests and learned men of Babylon were mainly Chaldæans.

There were astronomers or, more properly, astrologers, in several of the cities; and the towers, such as that of Babel, were probably both temples and observatories. The clearness of the sky and the levelness of the horizon on all sides favored the study of the stars, which was more closely connected with religion than any form of science. The Chaldæans worshipped the heavenly bodies. When Babylon was taken by Alexander the Great, in 331 B. C., there was found in the city a series of observations of the stars dating from 2234 B. C.

ARCHITECTURE AND ART.—Assyrian art must be considered great in architecture and sculpture. The emblematic figures of the gods show dignity and grandeur. The scenes from real life, of war, and of the chase, are bold and vivid; and in succeeding ages marked progress is shown in the acquirement of a more free, natural, life-like and varied execution, though the artists never learned perspective and proportion.

The Assyrians constructed arches, tunnels, and aqueducts; were skilled in engraving gems, and in the arts of enamelling and inlaying; made porcelain, transparent and colored glass, and even lenses; ornaments of bronze and ivory, bells, and golden bracelets and earrings of good design and workmanship, were all produced. In mechanics, and for measuring time, they used the pulley, the lever, the water-clock, and the sun-dial.

IMPLEMENTS AND METHOD OF WARFARE.—The implements and methods used in war, as the monuments show, included swords, spears, maces, and bows and arrows, as weapons of offence; cavalry and chariots for charging; movable towers and battering-rams for sieges; and circular intrenched camps as quarters for a military force.

RELIGION.—In common with all Semites, the Babylonians were exceedingly religious, and were consequently greatly in the power of their priests, through whom tithes and offerings to their numerous gods were made.

Their earliest chief divinity was apparently the god *Ea*, lord of the deep, possessor of unsearchable wisdom, and creator of all things. When, however, Babylon became the chief of the city states of Babylonia, *Merodach*, the god of that city, assumed the first place. He was a reflection of the sun, or the light of day, and was worshiped as he who constantly sought to do good to mankind. His chief title was *Bel*, (Baal of the Bible) "the Lord"; and his vast temples were maintained by the Babylonian kings with pride. The priests attached to this temple were richly endowed, and the maintenance of the worship involved a great outlay. The impression made by this temple and its worship on the Jews during their captivity is reflected in the account of Bel and the Dragon in the Old Testament.

The other gods of Babylonia would seem to have been the same as those of Assyria, which borrowed its religion, as well as its other culture, from Babylonia. *Asshur* was the chief god, and is always named first in the invocations of the kings. *Sin* was the moon-god, *Shamash* the sun-god, *Anum* the god of the sky, *Bel* the god of the earth, and *Ea* the god of the abyss and of profound wisdom. *Rammanu* (the Biblical Rimmon) was the ruler of the weather, *Ishtar* (the Biblical Ashtoreth) the goddess of love, *Nebo* the god of learning, and *Nergal* the god of war and hunting. The Assyrian temples always contained statues of the gods or goddesses, and sometimes a particular statue was held in special veneration, as the *Ihstar* of Nineveh, or the Ihstar of Arbela; only two statues of a god have been discovered in modern times, namely the two limestone figures of Nebo, disinterred in a temple at Nimrud, and dating from the eighth century B. C. With regard to public worship, we know that constant sacrifices and libations were offered to the gods, images were carried in procession, and a highly organized and richly endowed priesthood existed. The building and maintenance of temples were among the chief functions of the king, who himself boasted of the title of high priest.

JERUSALEM, THE HOLY CITY OF THE JEWS

THE HEBREWS AND THE HOLY LAND—PALESTINE

The history and characteristics of the Hebrews are fully dealt with in the Old Testament, the important parts of which should be familiar to everyone.

They were a pure Semitic race, akin to the Phœnicians, Chaldeans, and Assyrians. The founder of the nation was Abraham, who, about the twenty-third century before Christ, removed from the plains of Mesopotamia to the land of Canaan, on the southeastern coast of the Mediterranean Sea. This land has since been variously named Palestine, Canaan, the Land of Israel, or the Holy Land, and was the scene of most of the great events of the Bible. Just as the old name Canaan denoted originally the low-lying country along the coast, so Palestine means literally "Land of the Philistines," and was not used of the inland districts before the time of the Romans.

THE UNIQUE SITUATION AND IMPORTANCE OF THE HOLY LAND

The whole region is practically an isolated oasis, with a productive climate due to proximity to the sea.

All communication between the Babylonians, the Chaldeans and the Assyrians on the one hand, and the Egyptians on the other, was by the way of Palestine. Thus the Holy Land was at the very center of the ancient world. It is this position with its fundamental significance in history which renders it unique among the lands of the earth. It has always been the refuge of the drifting populations of Arabia. Never sought for itself alone, except by the Crusaders, it has been over-run constantly by invaders from the north seeking Egypt, or by the return attack. Thus the Hittites, Ethiopians, Assyrians, Egyptians, Scythians, Parthians, Persians, Seljuk Turks, and Mongols in turn devastated it. Alexander passed through to Egypt in 322 B. C.; the wars of the Seleucids and Ptolemies passed over it; Pompey in 65 B. C. brought it under the Roman Empire; the Crusaders established themselves there from 1098 to 1187; Napoleon in 1799 abandoned his first ambition on its soil. Yet its destiny was typified by the Arab conquest in 634 A. D.; there is everything to attract the desert tribes, but nothing for others except the religious sentiment of Christians.

HISTORY OF THE HEBREWS OR ISRAELITES

The ancestors of the Israelites were certain of the pastoral tribes having their abode in the wild tracts to the south and east of Palestine. Their nearest kinsmen were Edom, Ammon, and Moab. About 2200 B. C. they migrated under their tribal chief, Abraham, from Haran in Mesopotamia into the land of Canaan. Here the tribes continued to lead a pastoral life, and ultimately, in the time of Jacob, a famine in the land of Canaan led to a fresh migration into Egypt. This movement is especially associated with the name of Joseph.

ISRAELITES UNDER THE EGYPTIANS

Here they obtained leave from Pharaoh to dwell in the land of Goshen, where their continued adherence to their own customs and pastoral life led them to be accounted barbarians by the cultured Egyptians. In Egypt a time of great oppression came upon the Hebrews, and they were subjected to the harshest treatment and repressive measures, induced by a fear lest they should ally themselves with Egypt's foes. Then there arose the figure of Moses, the great founder of both the religion and the law of Israel.

THE EXODUS UNDER MOSES

Moses was the son-in-law of a priest of Midian, and at Horeb (i. e. Sinai), the mountain of God, he heard the call of Yahweh (Jehovah), his father's God, to deliver Israel from the bondage of Egypt. He had much difficulty in rousing the enthusiasm of those he was sent to save, but ultimately the work was accomplished by means of the miracles wrought by Yahweh on behalf of his people. Moses led the Israelites to Mount Sinai, and here a covenant was solemnly made with Yahweh, and the new religion of Israel was inaugurated, a religion that may rightly be called new, because based upon a conception of the Deity, more spiritual than any which had yet been conceived. From Sinai they passed to the work of conquering Canaan for which they had set out. An attempt made at Kadesh on the southern frontier was unsuccessful, and they returned to the wilderness, for a time which according to the Biblical narrative made the whole period forty years.

THEY ENTER THE LAND OF CANAAN

During this time Moses died, and it was under Joshua that the entry into Palestine was finally made. The Canaanites were put down, but intermarriage between Hebrews and Canaanites was frequent. Hence came the ills of idolatry. The Israelites now settled down to an agricultural and commercial life, entering in many cases into treaties of friendship with their Canaanite neighbors. This weakened the bonds of union between the various tribes and might well have led to the ultimate fusion of the two races; but it was prevented by the rise from time to time of the Judges, who roused the dying ardor of the tribes and led them to the extermination of the enemies of Yahweh.

PERIOD OF THE JUDGES

Fifteen such heroes are named in the Book of Judges, from which book it will be seen how various were the enemies with which they had to contend. Their period shows a regular alternation of sin, punishment, and salvation. After Joshua, comes a long period of falling away, followed by the rise of Othniel who delivers Israel from the oppressions of Cushan of Mesopotamia, into whose hands they had been given. On his death, Israel again sins and is punished by Eglon, king of Moab. This time salvation comes through Ehud, but his death is followed by another relapse into idolatry, and so things continue. Among the rest of the "Judges," the most famous are Deborah the prophetess, and Barak, Gideon, Jephthah, Samson, and the prophet Samuel.

During this period Israel does not come at all into contact with the great kingdoms of the East. At the time of the Hebrew settlement in Palestine, the country was under the suzerainty of the Pharaohs, but it is probable that by this time the suzerainty was little more than a name. The conflicts were rather with their own kinsmen, the Moabites, Ammonites, and also the Midianites.

THE POWERFUL PHILISTINE TRIBES

The Philistines were among the most powerful opponents of Israel, and the story of Samson relates particularly to them. It was while suffering under defeat from this race that the Israelites cried for a king, not only that by this centralization of authority more head might be made against the invaders, but also that they might be like "all the other nations." Samuel the prophet, who was at that time their leader, reluctantly consented to accede to their desires and chose as their king Saul, the son of Kish.

HEBREW MONARCHY, UNDER SAUL, DAVID AND SOLOMON

The sole monarchy occupied three reigns, those of Saul, David, and Solomon. Saul reigned for nearly forty years, and, after wars with the neighboring Moabites, Edomites, Amalekites, and others, was defeated and driven to suicide by the powerful Philistines.

Saul's son-in-law, David, the son of Jesse, reigned also about forty years, and, having conquered Jerusalem from the Jebusites (1048 B. C.) made it the capital of his kingdom, the seat of the national government and religion. David was a warlike monarch, and conquered the Philistines, Moabites, Edomites, and Syrians, extending his power from the Red Sea to the Euphrates.

THE MAGNIFICENT REIGN OF SOLOMON

His son, Solomon, succeeded him, and also reigned forty years (977-937 B. C.). Then the Hebrew nation attained the height of its power, and he confirmed and extended the conquests of David. Solomon married a daughter of a Pharaoh, king of Egypt, formed an alliance with Hiram, king of Tyre, built the magnificent temple at Jerusalem, and made his kingdom the supreme monarchy in western Asia.

An extensive commerce was carried on by land and sea. Solomon's ships, manned by Phœnician sailors, traded to the farthest parts of the Mediterranean westward, and from ports

on the Red Sea to southern Arabia, Ethiopia, and perhaps India. From Egypt came horses, chariots, and linen; ivory, gold, silver, peacocks and apes from Tarshish or Tartessus, a district in the south of Spain; and gold, spices, and jewels from Ophir, variously regarded as in southern Arabia, India, and eastern Africa, south of the Red Sea. The corn, wine and oil of Judæa were exchanged by Solomon for the cedars of Lebanon supplied by Hiram, king of Tyre.

DECLINE AND DIVISION OF THE MONARCHY

On the death of Solomon, in 975 B. C., the temporal glory of the Hebrews was eclipsed. Ten of the twelve tribes revolted against Solomon's son and successor, Rehoboam, and formed a separate kingdom of Israel, with Samaria as capital; while the tribes of Judah and Benjamin made up the kingdom of Judah, having Jerusalem for the chief city. The Syrian possessions were lost; the Ammonites became independent; commerce declined; idolatry crept in and grew; the prophets of God threatened and warned in vain; gleams of success against neighboring nations were mingled with defeat and disgrace suffered from the Edomites, Philistines, and Syrians, until, in 740 B. C., Tiglath-pileser II., king of Assyria, carried into captivity in Media the tribes east, and partly west, of the Jordan.

FALL AND CAPTIVITY OF ISRAEL

In 721 B. C., Sargon, king of Assyria, took Samaria, and carried away the people of Israel as captives beyond the Euphrates. The kingdom of Israel thus came to an end after a duration of about two hundred and fifty years.

In 713 B. C., Judah, under King Hezekiah, was attacked by Sennacherib, king of Assyria, and relieved by the destruction of the Assyrian army. A time of peace and prosperity followed, but in 677 the Assyrians again invaded the country, and carried off King Manasseh to Babylon.

FALL OF JUDAH AND BABYLONIAN CAPTIVITY

In 624 B. C., the good king Josiah repaired the temple and put down idolatry, but was defeated and slain by the Egyptian king Pharaoh-Necho, in 610. In 606 B. C., Nebuchadnezzar, king of Babylon, took Jerusalem, and made the king, Jehoiakim, tributary; on his revolt, Jerusalem was again taken, and ten thousand captives of the higher class were carried off to Babylon, with the treasures of the palace and temple. In 593 B. C., the Jewish king Zedekiah revolted from Nebuchadnezzar, who now determined to put an end to the rebellious nation. In 588 B. C., Jerusalem was taken and plundered; the walls were destroyed; the city and temple burned, and nearly the whole nation was carried away as prisoners to Babylon. For over fifty years the land lay desolate, and the history of the Hebrew nation is transferred to the land where they mourned in exile. Then were raised the voices of the prophets Jeremiah and Ezekiel and Isaiah, in their definite predictions of the Messiah.

The history of the Jews during the Babylonish captivity.

RETURN OF THE HEBREWS TO JERUSALEM

In 537 B. C., Cyrus the Great became monarch of the Persian Empire. He issued an edict in 536 B. C., by which the Jews were allowed to return to Jerusalem and rebuild their temple. Nearly fifty thousand Jews, chiefly of the tribes of Judah and Benjamin, went to the old home of their race under the command of Zerubbabel and Jeshua, taking with them many of the vessels of silver and gold carried away by Nebuchadnezzar. Zerubbabel was appointed governor of the land, now a dependency of the Persian Empire. In 519 B. C., the Persian king Darius Hystaspis confirmed the edict of Cyrus, and in 515 the Temple was completed and dedicated. The ten tribes disappeared at this time from history, such of them as returned to their land having united themselves with the tribe of Judah, and henceforth the Hebrews are called Jews and their country Judea.

THE JEWS UNDER EZRA AND NEHEMIAH

In the reign of the Persian king Artaxerxes more of the Jews emigrated from Babylonia to Judea under the command of Ezra, 458 B. C., and Ezra was governor of the land until 445.

Nehemiah was governor (with an interval) from 445 to 420, and under him the walls and towers of Jerusalem were rebuilt, and the city acquired something of its ancient importance. With 420 B. C. the history of the Jews ends, as far as the Scriptural narrative goes.

JUDEA BECOMES SUBJECT TO PERSIA

From 420 to 332, Judea continued subject to Persia, paying a yearly tribute, and being governed by the high priest, under the Satrap of Syria. In 332 B. C., Alexander the Great, then engaged in the conquest of the Persian Empire, visited Jerusalem, and showed respect to the high priest and the sacred rites of the Temple. In 330 the Persian Empire fell under the arms of Alexander, who died at Babylon in 323 B. C. Judea was taken possession of by Alexander's general, Ptolemy Lagus, and from 300 to 202 B. C. was governed by the dynasty of the Ptolemies, ruling Egypt, Petra and southern Syria. The government was administered by the high priests under the Ptolemies, whose capital was at the new city of Alexandria in Egypt. Now the Jews began to spread themselves over the world, the Greek language became common in Judea, and the Septuagint (or Greek version of the Hebrew Scriptures) was written during this and the following century.

In 202 B. C., Antiochus the Great, king of Syria (including in its empire Asia Minor, Mesopotamia, Babylonia, etc.), conquered Judea from Ptolemy V. Antiochus Epiphanes, one of the sons and successors of the great Antiochus, drove the Jews to rebellion by persecution and profanation of their Temple and religion.

STRUGGLE UNDER THE MACCABEES AND HYRCANUS

Under the great patriot and hero Judas Maccabeus, the Jews asserted their religious freedom in 166 B. C. Antiochus Epiphanes died in 164, and Maccabeus fought with success against the Idumeans, Syrians, Phœnicians and

others, who had formed a league for the destruction of the Jews. In 163, Judas Maccabeus became governor of Judea under the King of Syria, but fell in battle, in 161, while he was resisting an invasion of his country by the troops of Demetrius Soter, new ruler of the empire. His brother, Jonathan Maccabeus, ruled from 161 to 143 B. C., amidst many troubles from Syria, and was succeeded by his brother, Simon Maccabeus, who strengthened the land by fortifications, was recognized by the Romans as high priest and ruler of Judea, and fell by assassination in 136 B. C.

His son, John Hyrcanus, threw off at last the yoke of Syria, and made himself master of all Judea, Galilee, and Samaria, reigning then in peace till 106 B. C., when the line of the greater Maccabean princes ended. A miserable time of civil wars and religious and political faction followed.

THE CONQUEST BY ROME

These ended in the interference of Rome; and in 63 B. C. Pompey took Jerusalem, after a siege of three months, and entered the "Holy of holies" in the Temple, with a profanation before unheard of in Jewish history. From this time the Jewish state was virtually subject to Rome, and became, in the end, a part of the Roman province of Syria.

The turbulence of the Jews under Roman rule is well known, and a general rebellion ended, after fearful bloodshed and misery, in the capture and destruction of Jerusalem by Titus, A. D. 70. The history, as a separate political body, of the Hebrews thus ends with the dispersion of their remnant over the face of the civilized world.

GEOGRAPHY OF THE HOLY LAND

The area of the Holy Land is about eleven thousand square miles—nearly as large as Belgium; its greatest length, from Beyrout to the southern point of the Dead Sea, being one hundred and eighty miles, and its greatest breadth, east to west, about sixty-five miles. It has a nearly straight western coast-line, with but two indentations—the Bay of Sidon, and the Bay of Acre. Though the Sinaitic Peninsula is not a *geographical* part of the Holy Land, its *history* is really one with it, and is so considered in this article.

Notwithstanding its narrow limits, Palestine presents a remarkable variety of surface, scenery, and climate. The central portion consists of an undulating tableland (the "hills" or "hill-country"), separated from Lebanon on the north by the fertile Plain of Esdraelon (Jezreel). It has a gentle slope towards the west, but descends abruptly to the Jordan valley, the surface gradually rising, as it extends southward, till it reaches its greatest elevation (about 3,300 feet) in the neighborhood of Hebron, beyond which, near Beersheba, it sinks into the Idumæan Desert. The northern part of this tract is more fertile than that towards the south, the least productive district being the country round Jerusalem; but even there, the vine is grown with success, and the barren aspect of the plateau is relieved in many places by gardens of olives and figs and luxuriant cornfields.

To the west of the central tableland and the Lebanon ranges, there runs a strip of low seaboard, which expands into the plain of Philistia; to the north is the Valley of Sharon, once the Garden of Palestine, but now for the most part a marshy or sandy wilderness. The maritime plain is intersected by deep gullies, traversed in some cases by perennial streams. Oranges, lemons, citrons, bananas and melons grow luxuriantly, especially in the gardens of Jaffa and Ascalon.

East of the central tableland is a deep fissure, increasing in width from five to thirteen miles, down which flows the Jordan. Beyond Jordan is another upland district, forming a prolongation of the Anti-Libanus ranges, with an elevation of two to three thousand feet, succeeded on the east by a plateau which stretches away to the Arabian Desert. This region contains wide tracts of excellent pasture.

The highest point in Palestine is Jebel Jermuk (three thousand nine hundred and thirty-four feet). The height of Carmel—a northwestern spur of the uplands terminating in a promontory—one thousand seven hundred and forty feet.

MOUNT NEBO, a summit of Abarim, Moab (two thousand six hundred and forty-three feet), seven miles northeast of the Dead Sea, was the place of the death of Moses.

MOUNT TABOR (*tā'bor*), a wooded mountain in Palestine, six miles east of Nazareth, on the border of the plain of Esdraelon, according to a tradition, was the scene of the Transfiguration; and in the monastic ages it was peopled with hermits. Height, about one thousand eight hundred feet.

MOUNT SINAI (*sī'nī* or *sī-nā-ī*) and the SINAITIC (*sī-nȧ-it'ik*) PENINSULA. This peninsula, which, since 1907, has been included within the boundaries of Egypt, is situated between the Gulf of Suez and the Gulf of Akaba. In the north of the peninsula is the desert Paran, a desolate limestone plateau, bounded on the south by a tract of low sandstone mountains, ravines, and valleys rich in minerals which had been worked as early as 3000 B. C. Then rises the barren, rugged, and majestic triangle of the Sinai Mountain (also called Horeb) on which, tradition asserts, the Law was given to Moses.

From very early times it seems to have been regarded as a sacred mountain, perhaps as dedicated to the Babylonian moon-god Sin. These peaks are over six thousand feet high. At the base is a broad plain where the Israelites may easily have encamped. In a valley on the northeast of the same mountain, stands the famous convent of St. Catharine, with its beautiful gardens, which was originally founded by the Emperor Justinian (527-565). It became celebrated in recent years by the discovery of the Codex Sinaiticus (the Greek version of the Old Testament and the Greek New Testament), made in it by Tischendorf in 1844. There are two other valleys in the same vicinity, both of which are comparatively fertile and well-watered. The rocks of this region are steep and jagged and richly colored. They are composed of granite, porphyry, diorite, and gneiss. A path of stone steps leads up from the convent to the summit. Holy places marked by crosses cover the mountain. Near the top of Jebel Musa stands a chapel dedicated to Elijah.

MOUNT SINAI

where the Laws of Moses were received. The site is disputed, but these heights on the northwest cliffs of Jebel Mûsa seem to answer the required conditions better than any other mountain on the Sinaitic Peninsula. The law given from Sinai—"the book of the Covenant"—is contained in Exodus xx. to xxiii. 19. Besides the Ten Commandments there are rules for justice, equity and purity far transcending any known ancient legislation.

RIVERS, LAKES AND OTHER HISTORIC WATERS

The principal river of Palestine is the Jordan, which rises in Anti-Libanus in several streams, that unite to flow through Lake Merom, and then through the Sea of Tiberias, or Galilee, running due south into the Dead Sea. Several other streams flow into the Dead Sea, of which the best known is the Kedron, that rises near Jerusalem. A similar series of small rivers flows through the coast plains into the Mediterranean, the principal being the Kishon and Leontes.

THE JORDAN (meaning "the descender").—The highest source of the Jordan is seventeen hundred feet above sea-level on the west of Mt. Hermon, near the village of Hasbeya. The most important feature in its course between the Sea of Galilee and the Dead Sea is the rocky cleft known as the Ghor, some sixty-five miles long and from three to twelve miles in breadth, through which it passes. It then falls into the Dead Sea at a point twelve hundred and ninety-two feet below the level of the Mediterranean. The course of the Jordan is extremely tortuous, its total length being about two hundred miles.

The upper reaches are much obstructed by growths of reeds and shrubs, and though narrow it is deep, and can only be passed by the fords, of which there are many, the most famous being that of Bethabaca, near Jericho.

During its annual swelling it was miraculously crossed by the Israelites, probably at the ford above mentioned. In its waters Naaman was healed and an iron axehead made to swim. In it our Saviour was baptized.

SUPPOSED FORD OF BETHABACA, NEAR JERICHO, WHERE THE CHILDREN OF ISRAEL CROSSED THE RIVER JORDAN ON THEIR WAY TO THE "LAND OF PROMISE."

GALILEE, SEA OF, called also in the New Testament the Lake of Gennesaret and the Sea of Tiberias, is a large lake in the north of Palestine. Lying six hundred and eighty-two feet below sea-level, it is thirteen miles long by six broad, and more than eight hundred feet deep. It occupies a great basin, and is of volcanic origin. Although the Jordan runs into it red and turbid from the north, and many warm and brackish springs also find their way thither, its waters are cool, clear and sweet. In the time of Jesus the region round about the lake was the most densely populated in Galilee.

DEAD SEA, scripturally called "Salt Sea," "Sea of the Plains," "Sea of the Arabah," is near the southern extremity of Palestine. Its length is forty-six miles and its greatest breadth is nine and one-half (average eight and one-half) miles. The long oval of the lake is unequally divided by the El Lizan peninsula, of loose calcareous formation. North of the peninsula the greatest depth is twelve hundred and seventy-eight feet, south of that it is only three to twelve feet. It receives the Jordan and six other rivers, but has no outlet, the surplus water being carried off by evaporation. The water is intensely salt, with a specific gravity one-sixth greater than water. Fish cannot live in the lake but it has a healing reputation for lepers, and the inhabitants on the banks are quite healthy. It is surrounded by high cliffs of bare limestone, and masses of sulphur exposed by periodically occurring earthquakes lie on its borders.

CHIEF TOWNS AND INDUSTRIES

Modern Palestine forms part of the "pashalic" of Syria, under the Turkish Government, the chief towns of importance in modern times include: Jerusalem, with a population of about sixty thousand consisting of Moslems, Jews, and Christians; Damascus, with a population of two hundred thousand, has a trade in silk and cotton stuffs, jewelry, saddlery, and sword blades; Acre, a seaport, twelve thousand; Beyrout, one hundred and twenty thousand, considered to be the port of Damascus; Joppa, or Jaffa, a seaport, fifty-five thousand. The country is mainly agricultural, the crops consisting of wheat, barley, maize, vines and olives. The land is naturally fertile, but it suffered centuries of neglect.

JERUSALEM (signifying probably "abode of peace"), the "Holy City," central point of Hebrew worship and Christian tradition, was founded by the ancient Canaanite inhabitants upon a spur of the limestone ridge that forms the watershed of this part of Palestine. Standing at an elevation of twenty-six hundred feet upon a plateau about half a mile square and cut off by the deep valleys of Gihon on the west, Hinnon on the south, and Jehoshaphat east, the city held an almost impregnable position, and was only wrested from the

Jebusites by David, who made it the base of his military and political enterprises. The modern city proper is surrounded by a wall of hewn stones, two and one-half miles in circumference, and probably built by the Sultan Solyman the Magnificent. This wall is surmounted by thirty-eight towers and pierced by eight gates. The inner city is divided into four quarters—the Armenian in the southwest, the Jewish in the southeast, the Moslem in the northeast, and the Christian in the northwest. Since 1858 extensions have been made towards the north and west. In the older part the streets are narrow, dull, and dirty. The Mosque of Omar, the Church of the Holy Sepulchre, and the Jews' Wailing Place, are among the more interesting places.

It has always been a sacred city. Its drama of events included the reigns of David and Solomon; the sieges of Egyptian, Assyrian, and Babylonian hosts; the Greek conquest; the heroism of the Maccabees; the events of the Roman dominion; our Saviour's appearance and crucifixion; the siege of Titus and its destruction, A. D. 70; its rebuilding by Hadrian, A. D. 120; the Crusades, and its capture by Godfrey of Bouillon (first Christian King of Jerusalem), Richard Cœur de Lion, and its final capture by the Ottoman Turks in 1516.

The later-built additions extend much beyond the walls of Our Lord's time, and beyond the reputed site of Calvary (He "suffered without the Gate"), which is now in the middle of the city. Of the eight gates, one is called St. Stephen's, or Bâb Sitti Maryam (Lady Mary Gate), at the end of the via Dolorosa, leading to Gethsemane, Mount of Olives (where He beheld the city and wept over it), and Bethany. The Golden Gate, which He entered on Palm Sunday, is walled up. The relics of the old city are buried twenty to forty feet below the present site.

The Church of the Holy Sepulchre in the northwest quarter of the city is so called because alleged to contain under its roof the very grave in which the Saviour lay. This church, which was built by Helena, the mother of Constantine the Great, is remarkable for the richness of its decorations and the number of pilgrims by whom it is visited.

On Mount Moriah, Solomon is supposed to have built his famous temple, where a rectangular walled space called the Harâm at present encloses the Mosque of Omar and the El Aksa Mosque, once, perhaps, a Christian church. Recent explorers believe that they found traces of Solomon's masonry here, and the foundations of the existing walls are more safely identified with those of the sacred building as reconstructed by Hadrian.

According to the Jews, Abraham sacrificed here, the intended offering of Isaac was here, and Jacob anointed the rock. The Order of Knights Templar was founded in this Mosque. Just outside the extreme northeast corner of the Harâm, to be seen from the windows in north wall, down in a ravine, is the Pool of Bethesda, rarely containing water, half filled with rubbish.

North of the Harâm is a huge rocky platform, where the residence of the Turkish governor marks the site of the Court of Pontius Pilate.

The Golgotha Chapels on Mount Calvary are off the south side of the east end of the Church of the Crusaders. Steps lead up to them, their elevation being fourteen and one-half feet above the main building. Just beyond the top of the steps is a silver lined opening where the Cross was inserted in the rock; at a distance of about five feet the spots of the thieves' crosses are indicated—some searches are satisfied that the cross of the penitent thief would be the one to the north.

Gethsemane is at the base of Mount Olivet, and near it is the traditional Grotto of the Agony, with the spot where Judas betrayed his Master. This grotto is held in great veneration, and near it is the Church of St. Salvatore, said to have been erected by the mother of Constantine, containing the tombs of St. James, St. Ann, and St. Joseph.

The Via Dolorosa, or Way of the Cross, possesses a number of places of much interest, even if partly legendary. Among them the place where Christ is said to have pronounced the words "Daughters of Jerusalem, weep not for me." Where the Virgin is said to have fainted on meeting her Son. At a truncated column where Jesus fainted under the Cross, and they called on Simon of Cyrene to help him. The house of Dives, and the stone on which Lazarus sat. The Gate of Judgment, formerly marking the limits of the town, and the Calvary itself, now inclosed within the Church of the Holy Sepulchre.

Mount Zion (though used in the Scriptures as identical with Jerusalem) is just outside the southwest corner of the city wall. There were Christian churches erected here at very early dates over the spot where the Holy Ghost descended upon the Apostles, but there followed so many destructions, mutilations, and confusions, that little certainty attaches to the cluster of buildings now standing. Here is reputed to be the tomb of David, and the Room of the Last Supper, once part of a Christian Church.

The Mount of Olives is a range of eminences and slight depressions on the east side of Jerusalem, parallel with the hill of the Temple, but on higher ground. Here is the Tomb of the Virgin within a subterranean church, where she lay until her "assumption." A few yards from the Tomb, off the south side of the road, is the Garden of Gethsemane. The Chapel of the Ascension marks the tradition of the Ascension of Christ from this spot.

Bethlehem (*beth'lē-em*), (Heb., "house of bread"), is six miles south of Jerusalem. It was the birthplace of David, the scene of Ruth's story, and, most important of all (according to Matthew, Luke and John), the birthplace of Christ. The Church of St. Mary, at Bethlehem, is built over the birthplace of Christ. The Chapel of the Nativity is in the crypt of the church, under the great choir; here in the pavement is a star and the words "Hic de Virgine Maria Jesus Christus natus est" (Here Jesus Christ was born to the Virgin Mary); opposite the Chapel of the Nativity is the Chapel of the Manger.

Hebron (*hē'bron*) is situated on a hill among the mountains of Judah, about seven hours south of Jerusalem. It is one of the oldest existing biblical towns and was the home and burial-place of the patriarchs. Afterward it became an important city in the territory of Judah. David resided here the first seven years of his reign. Later it was taken possession of by the Idumeans, from whom Judas Maccabeus recaptured it. Upon the traditional site of the burial-place of the patriarchs, Machpelah, a magnificent mosque is erected.

Cana of Galilee, a decayed town near Nazareth, is celebrated in Scripture as the scene of our Saviour's first miracle, where He turned water into wine. Near it is the Mount of Beatitudes, the supposed scene of the Sermon on the Mount.

Damascus (*da-mas'kus*) formerly the capital and most important city of Syria, is situated in a fertile valley east of the Anti-Lebanon, on the edge of the desert. On account of its beautiful fertile surroundings, its lofty position, and its richness in fresh water, Damascus had been praised in antiquity and in modern times as the "paradise of the earth," "the eye of the desert,"

MARKET PLACE IN THE VILLAGE OF BETHLEHEM. THE CHURCH OF ST. MARY, NEARBY, IS BUILT OVER THE BIRTHPLACE OF OUR SAVIOUR, AND CONTAINS THE CHAPEL OF THE NATIVITY

and "the pearl of the Orient." Originally a Hittite city, it became the capital of Syria, and a great part of the country was called by its name.

In the Old Testament the name of Damascus occurs as early as the history of Abraham. After the time of David, Damascus often came into sharp collision with Israel. In the New Testament Damascus is known especially from the history of Paul.

Its chief modern glory is the Omayyad Mosque, and the ever changing color and variety of the street traffic, the costumes and the animation of the bazaars. The mosque was the subject of extravagant description by Arabian writers. In 1069 fire destroyed part of the building, and again in 1893 immense injury was done by fire; it has been restored, though it has not its ancient magnificence.

Jericho (*jer'i-kō*), situated west of the Jordan and fourteen miles east-northeast of Jerusalem, was destroyed by Joshua and rebuilt by Ahab. It was the residence of Herod the Great; was destroyed by Vespasian, rebuilt by Hadrian, and again destroyed by the Crusaders.

Nazareth (*naz'a-reth*) is celebrated as the dwelling-place of Jesus during his childhood and early manhood. The Church of the Annunciation here was founded by the empress Helena, but ruined in the middle ages, and rebuilt later. It is well proportioned, and, while much of the architecture is new, it preserves interesting memorials of the past. In the crypt is the traditional place of the Annunciation.

Petra (*pē'trä*).—On the northwest edge of the Arabian desert, about midway between the Gulf of Okabah and the Dead Sea, among desolate mountains, stand the remains of the rock-hewn city of Petra, best reached from Jerusalem. These ruins probably date from the time of Roman rule in 105 A. D., though some of the magnificent monuments were built by the Edomites who dwelt here before the Greeks and Romans.

This wonderful city is approached through a narrow gorge called the Sik, a kind of gateway in the rocks, like the entrance to a Roman amphitheatre.

Here one is confronted by a temple cut in the rock, with the most exquisite Corinthian columns, and entering the doorway he finds himself in the heart of the hill, surrounded by subterranean architecture of the most elaborate beauty of form and workmanship. This is called the Khaznet or Treasury of Pharaoh, which is rightly regarded as one of the wonders of the East. It is attributed to the Emperor Hadrian, who visited the place in A. D. 131, and erected here a temple to Isis. The rock wall from which it is hewn is an exquisite rose-pink. It is in a state of remarkable preservation. The imposing facade shows two rows each of six majestic columns, one row above the other, with niches in which are rock-hewn equestrian and other statues, the whole terminating above in a miniature temple crowned by a huge urn, the entire height being one hundred and two feet. Within is a bare lofty room and some chambers. The urn is said to contain treasures of Pharaoh. Neither the Coliseum at Rome, grand and interesting as it is, nor the ruins of the Acropolis at Athens, nor the Pyramids, nor the mighty temples of the Nile, present a more marvelous spectacle.

But this is only an introduction to the marvels behind. The gorge opens out into a narrow valley, some three miles in circumference, everywhere sunk deep beneath the enclosing mountains, and the walls of this valley are filled with the remains of other rock-cut temples, tombs and dwelling places. In one place are the remains of an open air theatre, the workmanship of which is Greek. Some of the structures, cut in the face of the rock, are several stories in height, while their architectural details excite the wondering admiration of the beholder. A stairway of many hundreds of steps leads to the largest of the ruins,

THE TREASURY OF PHAROAH

REMARKABLE NATURAL ENTRANCE

MARVELOUS ROCK-HEWN TEMPLES AT PETRA—(See under Petra)

El Deir, or Convent. In design it somewhat resembles the Treasury of Pharaoh.

The cliffs that enclose the valley are simply dotted all over with the handiwork of artists of a bygone age. Here is a portion of a heathen temple, there the remains of a palace, yonder a column, and beyond, again, a stately portico or pediment. They stand at varying elevations. Most of them are conspicuous, while others are hidden in the mountain recesses. There are tombs by the hundred, and on the mountain tops many places of sacrifice, where strange religious ceremonies were enacted. They challenge admiration by the variety of styles they embody, and by the exquisite hues of the sandstone from which they are hewn, varying from the prevailing purplish-red of the mountains and cliffs to a delicate pink and rose.

Until quite recently, this ancient city built out of rocks was seldom visited and almost unknown. Now, however, by means of the new Damascus to Mecca Railway, they are within easy reach. The journey from Jerusalem to Maan may be made in less than a day. From the latter place the ruins can be reached in six to eight hours by horseback.

Palmyra (*pal-mī'ra*), or **Tadmor** (*tad'môr*), a famous ancient city situated on an oasis in the desert east of Syria, is said to have been built by Solomon. After the decline of Petra in 105 A. D., Palmyra took its place as the chief commercial center in northern Arabia. Its merchant aristocracy reaped great advantage from the long-protracted wars between Rome and Parthia by acknowledging the supremacy of Rome. One of its chiefs, Odænathus, husband of the more famous Zenobia, extended his power over most

of the adjoining countries, from Egypt to Asia Minor. Aurelian at length crushed in 272 the attempt of the Palmyrenes to found an independent empire. After the Roman empire became Christian, Palmyra was made a bishopric. When the Moslems conquered Syria, Palmyra also submitted to them. From the fifteenth century it began to sink into decay, along with the rest of the Orient. Magnificent remains of the ancient city still exist, chief among them being the great temple of the Sun (or Baal); the great colonnade, nearly one mile long, and consisting originally of some fifteen hundred Corinthian columns; and sepulchral towers, overlooking the city.

Jaffa, is a maritime city in Palestine, Syria, fifty-four miles by rail northwest of Jerusalem, of which it was the port in King David's time. Extensive fruit and orange orchards surround the city. Its fortifications were destroyed by Saladin in 1188, and, during the Crusades, Richard the Lion-Hearted was confined here by sickness. In 1722 it was attacked by the Arabs, and in 1799 by Napoleon. The principal exports are oranges, wheat, soap, hides, olive oil, wool, and barley.

THE PHŒNICIANS

Phœnicia was a narrow strip of country on the southeastern coast of the great inland sea of antiquity, lying chiefly between Mount Libanus (Lebanon) and the Mediterranean shore, and extending for about one hundred and twenty miles north of Mount Carmel. Here lay the cities Tyre and Sidon, Byblus and Berytus, Tripolis and Ptolemais. The land was fertile, and rich in timber trees and fruits, such as he pine, fir, cypress, sycamore, and cedar; figs, olives, dates, pomegranates, citrons, almonds. Here was material for trade abroad, and comfort and prosperity at home, and the coast was so thickly studded with towns as almost to make one continuous populated line.

HISTORY AND GOVERNMENT OF PHOENICIA

The history of Phœnicia is peculiarly a history of separate cities and colonies, never united into one great independent state, though now and then alliances existed between several cities in order to repel a common danger. Each city of Phœnicia was governed by a king or petty chief, under or with whom an aristocracy, and at times elective magistrates, appear to have held sway. But the genius of the race cared little for political development; they devoted themselves almost exclusively to commercial pursuits.

THE GREAT CITIES OF SIDON AND TYRE

Sidon was probably the more ancient of the Phœnician cities. Its richly embroidered robes are mentioned in the Homeric poems. It was the greatest maritime city of the ancient world until its colony, Tyre, surpassed it, and it seems to have been subject to Tyre in the time of David and Solomon. About 700 B. C., it became independent again, but was taken by Nebuchadnezzar, king of Babylon, about 600 B. C., and became subject to Persia about 500 B. C. Under the Persian rule, it was a great and populous city, and, coming into the hands of Alexander the Great in 333 B. C., helped him with a fleet in his siege of Tyre. Its history ends with submission to Roman power, 63 B. C.

Tyre was a powerful city as early as 1200 B. C. The friendship of its king, Hiram, with Solomon is well known from the Hebrew Scriptures; and at this time the commerce of Tyre was foremost in the Mediterranean, and its ships sailed into the Indian Ocean from the port of Elath on the Red Sea. Tyre is celebrated for its obstinate resistance to enemies. Sargon, king of Assyria, besieged the city in vain for five years (721-717 B. C.). Nebuchadnezzar took thirteen years (598-585 B. C.) to capture it only partially, and it was taken by Alexander the Great after a seven months' siege, in 332 B. C. The old glory of Tyre departed with the transfer of its chief trade to the newly created city of Alexandria, though the indomitable energy of the Phœnicians again, in Roman times, made it a great seat of trade.

PHOENICIAN MARINERS FOUND CARTHAGE

Phœnicia was at the height of prosperity from the eleventh to the sixth centuries B. C. As a colonizing country it preceded the Greeks on the shores and islands of the Mediterranean, and sent ships to regions that the Greeks knew nothing of, save by report of the bold mariners of Tyre. Until the rise of Alexandria about 300 B. C., the sea trade of Phœnicia was rivaled only by that of Carthage, its own colony; and Phœnician merchants still kept up their great land trade by caravans with Arabia, central Asia and northern India, Scythia and the Caucasian countries.

By far the most renowned of all Phœnician colonies—famous in history for Hannibal's heroic hate of Rome and warlike skill—was Carthage, in the center of the northern coast of Africa. The date of its foundation is put about 850 B. C. At Utica and Tunis, to the north and south, Phœnician settlements were already existing.

VAST EXTENT OF PHOENICIAN COMMERCE

The trade of Tyre and her sister cities reached almost throughout the world as then known. They imported the spices—notably the myrrh and frankincense—of Arabia; the ivory, ebony, and cotton goods of India; linen yarn and corn from Egypt; wool and wine from Damascus; embroideries from Babylon and Nineveh; pottery, in the days of Grecian art, from Attica; horses and chariots from Armenia; copper from the shores of the Euxine Sea; lead from Spain; tin from Cornwall. Phœnicia exported not only these articles of food and use and luxury, but the rich purple dyes made from the murex (a kind of shell-fish) of its own coast, the famous hue of Tyre, with which were tinged the silken costly robes of the despots. From Sidon went the famous glass produced in part from fine white sand, found plenteously near Mount Carmel. There was gold from Ophir, and interchange of cedar, sent by Hiram, king of Tyre, for building Solomon's Temple, in barter for the wheat and balm and oil of Israel's fertile land.

So important was the trade by caravans through Babylon with the interior of Asia that the great town Palmyra (or "Tadmor in the desert") was founded or enlarged by Solomon to serve the traffic on its route through Syria to the valley of the Tigris and Euphrates.

THEIR ARTS OF CIVILIZATION INCLUDED OUR ALPHABET

As a money-making race the Phœnicians were skilled in arts by which the grand aim of its life could be attained. Great as they were at the dyeing vat and loom, adepts in working brass and other metals, and in fabricating glass, they were also the best ship builders and the most famous miners of their time. Their greatest service to civilization seems rather to have been in appropriating, developing, and spreading the ideas of others, especially in forming an alphabet for the Western world.

While the mythical story about Cadmus, taking his sixteen letters from Phœnicia into Greece, must be rejected, the European world owes to this race of traders the alphabetic symbols now in use. The gradual change of shape is easily traced in most of the signs as here given. The simple and ingenious device by which each sign stands for one elementary sound of human speech is largely due to the Phœnician people, as an improvement on the cumbrous hieroglyphics of Egypt. Of literature they have left nothing whatever recognized as really theirs.

THEIR CHARACTER AND RELIGION

They had a name for craftiness in trade, and wealth led to worse than luxury,—to flagrant vice. Their religion was a kind of nature worship closely related to that of the Babylonians. They adored the sun and moon and five planets, the chief deities being the male Baal, and the female Ashtoreth or Astarte. At Tyre a deity was worshiped with the attributes of the Greek god Hercules. There was also the worship of Adonis, under the name of Thammuz, in the coast towns; and this included a commemoration of his death, a funeral festival, at which the women gave way to extravagant lamentations. It was Phœnician women that allured Solomon to their form of religion; it was a princess of Phœnicia, Jezebel, that brought Ahab, her husband, king of Israel, to ruin; that slew the prophets of God, and left a name proverbial of infamy in life, and for ignominious horror in her death. The work done by Phœnicia in the cause of human progress was chiefly important and interesting in material or practical things.

THE MEDO-PERSIAN EMPIRE

WITH the Persian Empire we first enter on continuous history. A multiplicity of histories first met and commingled in that of Persia. The Persian Empire extended itself over the whole of western Asia, and into Europe and Africa; it drew together Bactria, Parthia, Media, Assyria, Syria, Palestine, Phœnicia, Asia Minor, Armenia, Thrace, Egypt, and the Cyrenaica. The voice of the Great King was law from the Indus on the east to the Ægean Sea and Syrian Gulf on the west, from the Danube and the Caucasus on the north to the Indian Ocean and the deserts of Arabia and Nubia on the south.

The empire of the Medes and Persians, commonly known as "the Persian Empire," absorbed all the territories of Western and Southwestern Asia (except Arabia), as well as Egypt and a small portion of Europe. The Medes and the Persians are treated of together, because of their intimate connection in race and the fact that Media was conquered by and included in Persia, as the latter empire rose into power and importance in the western Asiatic world.

GEOGRAPHICAL SITUATION OF MEDIA AND PERSIA

The map shows the position of Media on the tableland south of the Caspian Sea, east of Armenia and the Zagros Mountains, and north and west of the mountains of Persia proper and the great rainless Persian desert, or desert of Iran. The mountain ranges enclosed fertile valleys, rich in corn and fruits; and the Zagros Mountains had on their pastures splendid horses, which supplied the chargers of the king and nobles of Persia.

Persis, or Persia proper, was a mountainous district between the desert of Iran and the northeastern shore of the Persian Gulf. The country contained, among its hills, fertile plains and valleys abounding in corn, pasture and fruits.

ORIGIN AND CHARACTER OF THE MEDES

The close connection of the Medes, in origin and institutions, with the Persians, is shown in the famous expression, "The law of the Medes and Persians, which altereth not." The people migrated into Media at an early period, from the original abode of the Aryan race. By degrees they overcame the Scythian races whom they found in possession of the land. The Medes were a warlike race, strong in cavalry and archers. Their language was a dialect of the Zend, the ancient tongue of Persia, and their religion was the Magian.

Probably about 800 B. C. the Medes had established themselves in their new home. About 710 B. C., Sargon, king of Assyria, conquered some part of Media, and made settlements of Israelites taken captive by him from the cities of Samaria; but the Assyrians could never conquer the Medes, who at last grew into a powerful kingdom under native princes.

MEDIAN POWER FIRST ESTABLISHED BY CAYAXARES

The monarchy was founded by Cyaxares about 633 B. C. He extended the Median Empire westward, by conquest, through Armenia to the river Halys in Asia Minor. His great achievement was the capture of Nineveh, about 620 B. C., in alliance with the revolted Babylonians, and the consequent overthrow of the Assyrian Empire. Cyaxares reigned forty years, and died about 593 B. C.

He was succeeded by his son Astyages (*as-ty'a-jēz*), who reigned for over thirty years,—a despot of quiet life and peaceful disposition. The end of the Median monarchy came in 558 B. C., with his dethronement by Cyrus of Persia.

ORIGIN AND CHARACTER OF THE PERSIANS

The Persians, in race, language, and religion, were closely connected with the Medes. They appear first in human records as hardy and warlike mountaineers, noble specimens of the great Aryan race,—simple in their ways of life, noted for truthfulness, keen-witted, generous, and quick-tempered. The language which they brought with them when they migrated is known as the Zend, closely allied to the Sanscrit, and now only existing in the sacred books of the Zendavesta, containing the doctrine of Zoroaster (Persian name, Zarathustra), the founder of the Magian religion.

The Persians were, in their early history, subject to the Medes, but governed by their native princes. The Median supremacy passed to the Persians with the dethronement of Astyages, king of Media, by Cyrus.

FOUNDING OF THE PERSIAN EMPIRE BY CYRUS

Master of Media, Cyrus came next into collision with the great kingdom of Lydia,* in Asia Minor. Crœsus was king of Lydia when Cyrus met his attack and conquered him, in 546 B. C. The rising empire of Persia was thus extended to the western seaboard of Asia Minor. The Greek colonies on the coast next fell a prey to the arms of Cyrus, and in 538 B. C. he captured Babylon, as we have seen, and added the provinces of the later Babylonian Empire to the Persian. Before this he had conquered the territory eastwards between Media and the Indus, and restored the Jews from captivity. His power and life ended in his expedition against the Scythian people, by whom he was defeated and killed, in 529 B. C. Cyrus, the greatest as a king and the best as a man among all the Persian monarchs, had spread the Persian sway from the Hellespont on the west to the Indus on the east.

He was succeeded by his son Cambyses who is distinguished by his conquest of Egypt in 525. He died in 522, on his march from Egypt against a Magian pretender to the throne. The usurper reigned for a few months, and was then dethroned and slain in an insurrection

*Lydia, with its capital at Sardis, and extending from the coast of the Ægean Sea eastward to the river Halys, was easily one of the most powerful monarchies of the second class in Asiatic history. The Lydians were a highly civilized, wealthy, and energetic people, great in agriculture, manufactures, commerce and the arts. In music and metallurgy their names are famous as inventors or improvers; they were proverbial in the ancient world for luxury and the softer vices that attend it.

headed by Darius, son of Hystaspes, a noble, who succeeded to the throne.

THE GREAT REIGN OF DARIUS

Darius Hystaspis, or Darius I., reigned from 521 to 485 B. C., and was a great and able monarch. He finished the work which Cyrus had begun, by setting in order the affairs of the vast empire which Cyrus and Cambyses had conquered.

A PORTRAIT OF DARIUS THE GREAT

Here "The Great King," with state umbrella and attendants, as carved on one of the door-jambs of the palace of Darius I. at Persepolis. The original bears considerable traces of color.

Darius is credited with the establishment of highroads and swift postal communication between the provinces and the court. The kings of Persia resided in the winter at Susa, a warm place in the plain east of the Lower Tigris; in the summer at Ecbatana, in Media, by the mountains; and Babylon was a third capital of occasional residence in winter. From these different centers of power the Persian monarchs, according to their measure of energy and resolution, controlled the conduct of the satraps in every quarter of their widespread dominions.

ATTEMPT TO INVADE EUROPE, AND WAR WITH THE GREEKS

About 508 B. C. Darius invaded Scythia, and, crossing the Danube, marched far into the territory which is now European Russia; but the expedition ended in a retreat without encountering the enemy, and with great loss of men from famine. On his return his generals subdued Thrace and Macedonia, north of Greece, and added them to the Persian Empire.

His famous war with the Greeks arose out of the revolt of the Ionian Greek cities in Asia Minor in 501, and the burning of the city of Sardis by their Athenian allies. An expedition sent against Greece under the general Mardonius, in 492 B. C., was defeated by the Thracians on land, and frustrated by a storm in the Ægean Sea. In 490 a great armament was sent by Darius under Datis and Artaphernes, and then was fought the decisive battle of Marathon. Darius's proposed and long-prepared revenge upon the Greeks was baffled by a rebellion in Egypt; and he died in 485, leaving the task to his son and successor, Xerxes.

REIGN OF XERXES THE GREAT

Xerxes reigned from 485-465 B. C., and he began with the suppression of the Egyptian revolt in 484, devoting the next four years to preparations against Greece. The grand effort made in 480 has been ever famous in history for the magnitude of the host of men and ships employed, for the heroism of the resistance on the one side, and the completeness of the final disaster on the other, as will be seen in the history of Greece. Xerxes returned to Sardis, after the destruction of his fleet at Salamis, toward the end of the year 480. The defeat of his general Mardonius at Platæa ended the war in Greece, and the Persians lost their last foothold in Europe by the capture of Sestos on the Hellespont.

ARTAXERXES II. AND THE "RETREAT OF THE TEN THOUSAND GREEKS"

Artaxerxes II., reigned 405-359. At the beginning occurred the revolt of his

younger brother Cyrus, satrap in Western Asia, who marched against Babylon, and fell in the battle of Cunaxa, 401 B. C. He was supported by a body of Greek mercenaries, whose retiring march to the Black Sea over the mountains of Kurdistan has been immortalized by Xenophon's description in his Anabasis, and is known as the "Retreat of the Ten Thousand Greeks." After many conflicts between the Persians and Greeks, the peace of Antalcidas, concluded in 387 B. C., gave to the Persians all the Greek cities in Asia Minor. The Persian Empire, however, was now going to decay. Artaxerxes failed to recover revolted Egypt, and was constantly at war with tributary princes and satraps. The want of cohesion in the unwieldy, ill-assorted aggregate of "peoples, nations, and languages," was being severely felt.

DARIUS III. LAST OF THE PERSIAN EMPERORS

In 336 B. C., the last king of the Persian Empire, Darius III., surnamed Codomannus, succeeded to power. With the great battle in the plains of Gaugamela, in Assyria, known as the battle of Arbela, from a town fifty miles distant, where Darius had his headquarters before the struggle, the Persian Empire came to an end in October, 331 B. C. The defeat of Darius was decisive; and in 330 he was murdered in Parthia by Bessus, one of his satraps. Asiatic Aryans had succumbed at last to their kinsmen of Europe, who, after repelling Oriental assaults upon the home of a new civilization, had carried the arms of avenging ambition into Asia, and struck a blow to the heart of the older system.

SCIENCE AND THE ARTS IN PERSIA

In science, art, and learning, the Persians developed nothing that was new, except in architecture. In the conquest of the Assyrians, Babylonians, Phœnicians, and Egyptians, the Persian kings and nobles came into possession alike of the scientific acquirements and learning of those peoples, and of the products of their mechanical arts. The Persians were soldiers, and not craftsmen, and had no need to be producers, when they could be purchasers, of the carpets and muslins of Babylon and Sardis, the fine linen of Egypt, and the rich variety of wares that Phœnician commerce spread throughout the empire.

ARCHITECTURE.—In architecture, they were at first pupils of the Assyrians and Babylonians. The splendid palaces and temples of Nineveh and Babylon had existed for centuries before the Persians were anything more than a hardy tribe of warriors, and it was only after the acquirement of imperial sway that they began to erect great and elegant buildings for themselves. When that time came, the Persians showed that they could produce, by adaptation of older models, an architectural style of their own. This style was one that comes between the sombre, massive grandeur of Assyrian and Egyptian edifices and the perfect symmetry and beauty of the achievements of Greek art.

PALACES AND TOMBS, not temples, were the masterpieces of Persian building. The ruins of the city of Persepolis, in the province of Persis, are the most famous remains of Persian architecture. Here, on a terraced platform, stood vast and splendid palaces, the doorways adorned with beautiful bas-reliefs. The great double staircase leading up to the "Palace of Forty Pillars" is especially rich in sculptured human figures. The columns are beautiful in form, sixty feet in total height, with the shaft finely fluted, and the pedestal in the form of the cup and leaves of a pendent lotus. Throughout the ruins a love of ornament and display is visible. In the bas-reliefs are profuse decorations of fretwork fringes, borders of sculptured bulls and lions, and stone-work of carved roses.

PERSIAN CITIES

Babylon has been already described.

Ecbatana, formerly the capital of the Median Empire, was a very ancient city, surrounded by seven walls, each overtopping the one outside it, and surmounted by battlements painted in five different colors, the innermost two being overlaid with silver and with gold. The strong citadel inside all was the royal treasury.

Susa was a square-built city unprotected by walls, but having strongly fortified citadel, containing a royal palace and treasury. The only remains of the place are extensive mounds, on which are found fragments of bricks and broken pottery with cuneiform inscriptions.

Persepolis was one of the two burial-places of the Persian kings, and also a royal treasury. Darius I. and Xerxes greatly enlarged and adorned the city, which retained its splendor till it was partially burned by Alexander the Great. The tomb of Cyrus and a colossal bas-relief sculpture of the great founder of the monarchy, was at Murghab, northeast of Persepolis.

Sardis, in western Asia Minor, once the capital of the Lydian monarchy, was an almost impregnable citadel, and the residence of the satrap of Lydia, and is often mentioned in connection with the Persian kings.

PERSIAN LIFE

The splendor of Persian life at court and abroad is known to us from many sources. The sculptures of Persepolis show something of the state and ceremony attendant on a Persian king. In the Book of Esther we read of King Ahasuerus (Xerxes) entertaining all "the nobles and princes of the provinces" for "a hundred and fourscore days," of his making a feast for seven days "in the court of the garden of the king's palace" for all the people of Susa; of pillars of marble, silver curtain rings, beds of gold and silver, pavements of marble that was red, and blue, and white, and black; of drinking vessels of gold diverse in shape and size, and "royal wine in abundance, according to the state of the king"; of garments of purple and fine linen; and of the absolute power of a Persian despot in his caprices and his wrath, with his "seven chamberlains that served in his presence," and with the lives of men and women of all ranks held in the hollow of his hand.

THE MAGI.—The priests or Magi had great power, from the reverence of the people for them. The great objects of worship were the heavenly bodies. This national priesthood, like the Chaldeans in the Babylonian Empire, formed a caste to whom belonged all mental culture and legislation. The modern term "magic," in its superstitious sense, is connected with their professions and practices.

THE GREEKS: GLORY OF THE ANCIENT WORLD

THE interest of the great story of ancient Greece is inexhaustible. Of all histories of which we know so much, this is the most abounding in consequences to us who now live. The Greeks are the most remarkable people who have yet existed. This high claim is justly made on the grounds of the power and efforts that were required for them to achieve what they did for themselves and for mankind. With the exception of Christianity, they were the originators of most of the great things of which the modern world can boast. The period from the permanent settlements in Greece until its final reduction to a Roman province covers about two thousand years.

THE name Greece was almost unknown by the people whom we call Greeks, and was never used by them for their own country. It has come to us from the Romans, being really the name of a tribe in Epirus, northwest of Greece, the part of the country first known to them.

THE LAND OF HELLAS AND THE HELLENES

The Greek writers and people called their land Hellas, the term meaning all territory in which their own people, the Hellenes, were settled. Hellas included not only the Greek peninsula, but many of the islands of the Ægean Sea, and the coast settlements and colonies above referred to. The peninsula, much indented by bays, was broken up into many small divisions, connected by the sea. There were numerous mountains in ridges, offshoots, and groups; there were plains, valleys and small rivers. All was diversified. The position and conformation of the country undoubtedly helped to render the Greeks the earliest civilized people in Europe, both by developing, in a life of struggle with nature on land and sea, their special and innate character, and by bringing them into contact with the older civilizations, in Egypt and Phœnicia, on the eastern shores of the Mediterranean. The mountains that divided the country into small isolated districts had a great political importance in giving rise to many separate and independent states, the rivalries and conflicts of which favored the working-out of political problems and the growth of political freedom.

GREAT DIVISIONS OF GREECE

Greece naturally divides itself into Northern, Central and Southern. Northern Greece contained two principal countries, Thessalia and Epirus, though the Greeks themselves did not regard the inhabitants of Epirus (the Epirots) as being of real Hellenic race. It was only in later times that Macedonia, north of Thessalia, was considered a part of Hellas.

Central Greece had nine separate states, the most important of which was Attica, the peninsula jutting out southeastward, and renowned forever through its possession of the city of Athens.

Southern Greece, or the Peloponnesus (meaning "island of Pelops,"a mythical king), contained seven principal states, Laconia being the most important, and sharing the fame of Attica because it contained the city of Sparta.

THE FAMOUS GRECIAN ISLANDS

The largest of the islands on the coast was Eubœa, about ninety miles in length, noted for good pasturage and corn. On the west coast was the group known to modern geography as the "Ionian Isles." To the south lay Crete, one hundred and sixty miles in length, noted for the skill of its archers. In the Ægean Sea were the two groups called the Cyclades and Sporades. The Cyclades (or "circling isles," the chief being Delos) are clearly shown upon the map. The Sporades (or "scattered isles") lay to the east off the southwest coast of Asia Minor. Northward in the Ægean, in mid-sea, or on the Asiatic coast, were Lemnos, Scyros, Lesbos, Chios and Samos.

THE EFFECT OF GREEK COLONIZATION

The establishment of so many colonies in countries pre-eminently favored by nature in productions and climate, and so situated as to prompt the inhabitants to navigation and commerce, gave a great impulse to the civilization of the Hellenic race, and may be regarded as the main cause of its rapid progress.

HISTORY OF THE GREEKS

I. THE PRE-HISTORIC PERIOD.—This period includes the mythical accounts of the origin of the Greeks, the Trojan war, the more certain story of the excavations, and the establishment of the peculiar Greek institutions under the so-called rule of the half-mythical kings. Down to the time of the Trojan war very considerable progress had already been made, and civilization among the Greeks had received its first important impulse. The oracles at Delphi and Dodona had been established; the mysteries at Eleusis; the four sacred games; the court of Areopagus at Athens; and the celebrated Amphictyonic Council. The arts and sciences likewise received considerable attention. Letters had been introduced by Cadmus. The accounts of the siege of Thebes and that of Troy show that progress had been made in the various arts pertaining to war, but the history of the period as a whole exhibits that singular mixture of barbarism with cultivation, of savage customs with chivalrous adventures, which marks what is called an *heroic age.*

According to the Greek historians, the earliest inhabitants of Hellas were the so-called Pelasgians, but the information afforded by the ancients on the subject is scant and vague.* For our knowledge of the inhabitants and civilization of prehistoric Greece, we are therefore dependent on the more certain witness of the excavations, which, in recent years, have yielded very important results.

THE MINOAN AGE

Excavations at Knossus in Crete have revealed to us the civilization of the Minoan age of Greek history. This civilization is the oldest of which we have knowledge. It flourished about 2000 B. C. Prehistoric Knossus was a city of massive structure in which the fine arts flourished and had reached a remarkably high stage of development (specimens of Minoan pottery are of exceptional beauty and grace) and in which the art of writing was known. This last fact is of great importance, as until recently the art of writing in Greece was supposed to be post-Homeric.

THE MYCENEAN AGE

The next age of Greek civilization on which archæology has concentrated its searchlight is the Mycenean (fl. c. 1600-1100 B. C.). The Mycenean civilization is revealed to us by excavations in the sites of Mycenæ, Tiryns, etc. The characteristic features of these splendid cities is their massiveness and solidity. Pausanias relates that tradition attributed the building of Tiryns and Mycenæ to the Cyclopes (hence the expression "Cyclopean walls" used to denote structures of this massive type), thus testifying to the gigantic edifices of prehistoric times as contrasted with the masonry of a later date. The jewelry, pottery and weapons excavated from these ancient cities are of rare beauty. Iron was practically unknown in the Mycenean age. Its use is more extensive in the Homeric age, and therefore Homeric civilization is probably post-Mycenean.

THE SO-CALLED DORIAN INVASION

But vast invasions swept over Greece, and a ruder civilization displaced this early culture. In the latter half of the eleventh century B. C., the Dorians ravaged Greece. They were a coarser, hardier stock than the peoples they conquered, but they brought to Greece a new vigor and a new robustness, which when toned and harmonized by the finer influences of the land, produced that civilization which is the world's marvel for all time.

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*Many of the early myths and legends, as narrated by Homer and preserved by Hesiod (in his Theogony), were gathered into somewhat systematic form to explain the genealogy of the Hellenic tribes, their subdivisions, and the origin of the Greek cities. The foundation of Athens, for example, was ascribed to Cecrops, regarded by some as a native of Egypt; he is said to have introduced into Attica the arts of civilized life, and from him the Acropolis was first called Cecropia. Argos was believed to have been founded by another Egyptian, named Danaus, who fled to Greece with his fifty daughters, and who was elected by the people as their king, and from whom some of the Greeks received the name of Danaï. Thebes, in Bœotia, looked to Cadmus, a Phœnician, as its founder; he was believed to have brought into Greece the art of writing, and from him the citadel of Thebes received the name of Cadmea. The Peloponnesus was said to have been settled by, and to have received its name from Pelops, a man from Phrygia in Asia; he became the king of Mycenæ, and was the father of Atreus, and the grandfather of Agamemnon and Menelaus, chieftains in the Trojan war. Such traditions as these show that the early Greeks had some notion of their dependence upon the Eastern nations.

LEGENDS OF EARLY NATIONAL EXPLOITS.—The legends are not only grouped about particular places and individual heroes, but have for their subjects national deeds marked by courage and fortitude.

One of these stories describes the so-called "Argonautic expedition"—an adventurous voyage of fifty heroes, who set sail from Bœotia under the leadership of Jason, in the ship Argo, for the purpose of recovering a "golden fleece" which had been carried away to Colchis, a far distant land on the shores of the Euxine.

Another legend—the "Seven against Thebes"—narrates the tragic story of Œdipus, who unwittingly slew his own father and married his own mother and was banished from Thebes for his crimes, after having been made king; and whose sons quarreled for the vacant throne, one of them with the aid of other chieftains making war upon his native city.

But the most famous of the legendary stories of Greece was that which described the Trojan war—the military expedition of the Greeks to Troy, in order to rescue Helen, who was the beautiful wife of Menelaus, king of Sparta, and who had been stolen away by Paris, son of the Trojan king. The details of this story—the wrath of Achilles, the battles of the Greeks and the Trojans, the destruction of Troy, and the return of the Grecian heroes—are the subject of the great epic poems ascribed to Homer. All these legends, whether derived from a foreign source, or produced upon native soil, received the impress of the Greek mind. They form one of the legacies from the prehistoric age, and reveal some of the features of the early Greek character.

II. PERIOD OF MIGRATIONS AND FORMATION OF STATES.—The first governments of Greece were small monarchies, and they continued such until after the Trojan war. Soon after this we find the country involved in fatal civil wars, in which the people, under a number of petty chieftains hostile to each other, suffered extremely from calamity and oppression. These evils led to change in the form of government, and the substitution of the *popular* instead of the *regal* system. The same evils also probably contributed to the spirit of emigration, which so strikingly marks the period. During this period of colonization we notice the origin of the four principal dialects in the Greek language. In this period two of the Grecian states are chiefly conspicuous—Athens and Sparta, whose special effort was to provide themselves with a suitable political constitution, civil code and government.

These great migrations which swept over Greece created a congestion of the population which was eventually relieved by widespread colonization on the west coast of Asia Minor and in the neighboring islands of the Ægean Sea. These colonies were settled by the three races, the Æolians, Ionians and Dorians. The Æolians colonized the northwestern part, the coast of Mysia, and the island of Lesbos. The Ionians settled in the central part, on the coast of Lydia, and in the islands of Chios and Samos. The Dorians occupied the southwest corner of Asia Minor (the coast of Caria) and the adjacent islands. Of all these by far the most important, wealthy and powerful were the Ionians.

OTHER GREEK COLONIES

The Greeks gradually spread themselves in settlements along the northern coast of the Ægean Sea and the Propontis, in Macedonia and Thrace, so that the whole Ægean became encircled with Greek colonies, and its islands were covered with them. The tide of emigration flowed westward also in great strength.

The coasts of Southern Italy were occupied by Dorians, Achæans, and Ionians in settlements which grew to such importance that the region took the name of Magna Græcia, or Greater Greece. The cities of Tarentum, Croton and Sybaris became famous for their wealth, the latter giving rise to the proverbial name for a luxurious liver.

On the southwestern coast of Italy was Rhegium, and farther north came Pæstum, Cumæ, and Neapolis (Naples). In Sicily flourishing Greek settlements abounded, the chief being Messana, Syracuse, Leontini, Catana, Gela, Selinus, and Agrigenitum. Farther west still a colony from Phocæa, in Asia Minor, founded the city of Massilia, now Marseilles. On the southern coast of the Mediterranean, westwards from Egypt, the Greek colony of Cyrene became the chief town of a flourishing district called Cyrenaica.

The establishment of the later of these colonies brings us down well within authentic historical times, and the whole period of Greek colonization extends from about 1100 to 600 B. C., the colonies being, in many cases, offshoots of colonies previously established and risen to wealth and over-population. In all these movements and settlements, the enterprise and ability of the Greeks made them great commercial rivals to, and successors of, the Phœnicians.

CONTRAST BETWEEN IONIANS AND DORIANS

The two leading races of Greece were the Ionians and the Dorians, and they stand to each other in a strong contrast of character which largely affected Greek political history. These prominent points of difference run through the whole historical career of the two chief states, *Ionian* Athens and *Dorian* Sparta, and were the cause of the strong antagonism that we find so often in action between them. The Dorian was distinguished by severity, bluntness, simplicity of life, conservative ways, and oligarchic tendency in politics; the Ionian was equally marked by vivacity, excitability, refinement, love of change, taste in the arts, commercial enterprise, and attachment to democracy. The Dorian, in the best times of his history, reverenced age, ancient usage, and religion; the Ionian, at all periods of his career, loved enjoyment, novelty and enterprise.

THE EARLY CAREER OF SPARTA

The Spartans, or the people of Lacedæmon, properly the southern half of Laconia, first became the dominant nation in that part of Greece. Of Spartan doings and fortunes we know almost nothing until the time of the great Legislator Lycurgus, who is said to have organized, about 850 B. C. the famous Spartan constitution. The probable account is that he altered and reformed existing usages, and that the reverence of after ages ascribed to him the promulgation and establishment of a full grown, brand new set of institutions, which must have been, in many points, of gradual growth.

THE FAMOUS LAWS OF LYCURGUS

The government was that of an aristocratic republic under the form of a monarchy. There were two kings, whose powers were nominally those of high priests, judges, and leaders in war, but in the two latter capacities their functions were in time greatly restricted and almost superseded. The chief legislative and judicial and much of the executive, power lay with the Senate, or council of twenty-eight elders. No citizen could be a member of this body until he had become sixty years of age, and the office was held for life. The popular assembly, open to every Spartan citizen over thirty years old, really handed over its powers to a board of five commissioners, officers called Ephors ("overseers"), whom it annually elected. These high officials had a secret and irresponsible control over the executive power, both at home and abroad; and in military enterprises, where the kings were the nominal leaders, the two Ephors who accompanied the army exercised much influence. The whole body of Spartan citizens was an aristocracy, and among themselves entire political equality existed.

TRAINING OF THE SPARTAN CITIZEN

The object of the peculiar training of Spartan citizens, ascribed to Lycurgus, was the maintenance of Spartan supremacy over the subject population. It was necessary for safety that the small body of men, surrounded by enemies in their own land, should be ready at all points,

against every attempt at opposition or rebellion, and against the outside world as well.

As every man had to be a soldier, and the citizen existed only for the state, the state took the Spartan citizen in hand at his birth, and regulated him almost from the cradle to the grave. From the age of seven the body was cultivated, and every means was used to give the instrument the finest temper, in a physical sense, and to bring it to the sharpest edge. Such training lasted till the sixtieth year of life, when the Spartan became qualified by age, if not by wisdom, for election to the Senate, or "assembly of old men," above described.

The girls were trained in athletic exercises like those of the youths, and everything was done to produce vigorous and stern women, prepared to gladly see their sons die on the battle-field for Sparta.

The result of all was that the Spartans became a race of well-drilled and intrepid warriors, but a state distinguished in the history of Greece for the display of a domineering arrogance, a rapacity, and a corruption, which contributed not a little to its downfall. However, the Spartan institutions were very successful in giving the state security at home and success in war abroad. Sparta was free from domestic revolutions, and the spectacle it presented of constancy to fixed maxims of policy gave it a great ascendency over the Hellenic mind.

EARLY HISTORY OF ATHENS. THESEUS

The Athenians became by far the most famous, in political ascendency and in artistic and intellectual eminence, of all the Ionian race, to which they belonged.

At first they were under kings like the other Hellenes; but about 1050 B. C. the title of king became changed to that of archon ("ruler"), though the office was still held for life, and continued in the same family. The archon was responsible for his acts to a general assembly of the people, in which, however, the nobles had the chief influence; and down to long after the time of the first Olympiad, Athens may be regarded as an oligarchic republic, in which the supreme office, the archonship, was confined to one family; and members of the chief court of justice, called Areopagus (lit. "hill of Ares," the place of its assembly at Athens), were elected only from the noble houses.

IMPORTANCE OF THE OLYMPIADS IN GREEK CHRONOLOGY

We come, in the year 776 B. C., to the era when the chronology of Grecian history becomes consecutive, and dates are reckoned by Olympiads. These were the periods of four years each which elapsed between the successive celebrations of the Olympic games in honor of the Olympian Zeus (the chief Greek deity) in the plain of Olympia in Elis (in Peloponnesus). The First Olympiad began at midsummer, 776 B. C., the Second Olympiad at midsummer, 772 B. C., and so on—any event being dated by a particular year of a specified Olympiad.

THE UNPOPULAR LAWS OF DRACO

Down to the year 621 B. C. the people were still without a substantial share in the government, and popular discontent demanded a written code. Consequently Draco, one of the archons, drew up laws, the severity of which has become proverbial, and which were intended, by their rigor, to check the growth of the democracy that was clamoring for a change. The penalty of death was assigned to all offenses, great or small, to enable the nobles to get rid of dangerous leaders of the people; but such a system did not long continue.

Anarchy prevailed in Attica, owing to the various factions of the oligarchs, the democrats, and a middle party (the moderates).

SOLON REFORMS THE LAWS

A wise reformer was found in Solon, chosen as an archon in 594 B. C., and invested by his fellow citizens, for the special purpose of restoring tranquility, with unlimited power to change the laws. He was already distinguished as a poet and as a general in the war of Athens against her neighbor, Megara. His great object was to remove the oppressive and excessive power of the aristocracy without introducing pure democracy.

Solon began with the abolition of Draco's code, but retained the penalty of death for murder. His celebrated disburdening ordinance for the relief of debtors won the complete confidence of the people. This had the immediate effect of mitigating the oppressions caused by the old laws of debt: in future neither the person, family, nor estate of the debtor might be pledged in security for the loan. A further democratic character was given at the outset to the constitution of Solon by the division of the people into four classes, according to property, which was now substituted for birth as a qualification for the higher offices of state.

A council of state, or senate, called the Boule (council) was chosen annually by lot, to prepare measures for submission to the popular assembly, or Ecclesia, in which the citizens of the fourth or lowest class (who could hold no state office) had the right of voting. The Ecclesia included all classes of the citizens, who there legislated, elected the magistrates, decided on peace or war, and other matters sent down to it from the Boule.

For the courts of justice below the Areopagus, a body of six thousand jurors was to be annually selected by lot from the popular assembly, and the causes were tried by divisions of the whole body.

Solon was also the author of many laws which regulated private life and rights, public amusements, slavery, marriage, and other matters. Among his miscellaneous enactments may be noted that which legalized the export of olive oil only, that which obliged the father to teach his son a trade, that which penalized a citizen for remaining neutral on the outbreak of civil strife, and that which empowered a man who died childless to dispose of his property by will.

SOLON'S CONSTITUTION OVERTHROWN BY PISISTRATUS

During Solon's absence on a tour of travel a renewal of factions followed and their struggles ended in the seizure of power by Pisistratus, in the year 560 B. C. He was one of the class

of rulers called "Tyrants" by the Greeks, who held power in Greek states during this and the preceding century.

The Greek Tyrants were aristocratic adventurers who took advantage of their position and of special circumstances to make themselves masters of the government in their respective states.

It is to Pisistratus, however, that the world owes the preservation in their present form of the poems of Homer, which he caused to be collected and edited in a complete written text. He was succeeded by his sons Hippias and Hipparchus, as joint rulers; but the severity of Hippias (after the murder of Hipparchus) caused his expulsion by the people, and the end of the despotism at Athens, 510 B. C.

ATHENS A PURE DEMOCRACY UNDER CLEISTHENES

The government at Athens now (507 B. C.) became a pure democracy, under the auspices of Cleisthenes. At the head of the popular party he effected important changes in the constitution. The public offices of power were thrown open to all the citizens, the whole people was divided into ten tribes or wards, and the senate (Boule) now consisted of five hundred members, fifty from each ward or tribe.

Political Ostracism.—Cleisthenes introduced the ostracism (from ostrakon, the oyster-shell, on which the vote was written), by which the citizens could banish for ten years, by a majority of votes, any citizen whose removal from the state might seem desirable. This device was intended to secure a fair trial for the new constitution by checking the power of individuals who might be dangerous to popular liberties, and by putting a stop to quarrels between rival politicians.

Athens had at last secured a government of the thoroughly democratic type, and from this time began to assume a new and ever-growing importance in Greece, and was soon regarded as the chief of the Ionian States. The people, through the Ecclesia, became thoroughly versed in public affairs, and practically, as well as legally, supreme in the state.

GROWTH AND IMPORTANCE OF SPARTA

As Athens had Draco and Solon as its great lawgivers, so Sparta found in Lycurgus her lawgiver. His institutions gave a permanent cast to the Spartan character, and were not abolished until the last ages of Greece. The system of Lycurgus, meanwhile, had made Sparta a thoroughly military state, and in two great wars (743-723 and 685-668 B. C.) it conquered its neighbors on the west, the Messenians, reducing them to the condition of the Helots, and appropriating their land. By this and by successful war against its northern neighbors, the people of Argos, Sparta acquired the supremacy and became the leading Dorian state of Peloponnesus and of the Grecian world. These two great states of Greece, Athens and Sparta, now were (about 500 B. C.) with the rest of Greece to encounter Persia; and Europe, with united Greece for her champion and representative, was to triumph over the older civilization and prowess of Asia.

III. PERIOD OF PERSIAN WARS AND MILITARY GLORY.—To this age the Greeks ever after looked back with pride, and from its history orators of every nation have drawn their favorite examples of valor and patriotism. The Persian invasion called forth the highest energies of the people, and gave an astonishing impulse to Grecian mind. The design of subjugating Greece originated in the ambition of Darius the Persian king, the second in succession from Cyrus the Great. He found a pretext and occasion for the attempt in a revolt of his Greek subjects in Asia Minor, in which Sardis, the capital of Lydia, was pillaged and burned. The war was carried on by three successive kings, Darius, Xerxes and Artaxerxes, but on neither of them did it confer any glory; while the battles of Marathon, Thermopylæ, Salamis, Mycale, and Platæa, secured immortal honor to the Greeks. A succession of splendid names adorns the history of Athens during this period. Miltiades, Themistocles, Aristides, Cimon, and Pericles, acted distinguished parts in the brilliant scene. Sparta also justly gloried in the self-sacrifice of Leonidas and his three hundred brave companions. The period of the Persian war was the age of the highest elevation of the national character of the Greeks. Before it, there existed little union comparatively between the different states, and it was not till Athens had alone and successfully resisted the strength of Persia at the battle of Marathon, that other states were aroused to effort against the common enemy. In the confederation which followed, Sparta was the nominal head, but the talents, which actually controlled the public affairs, were found in the statesmen of Athens. To Athens, therefore, the supremacy was necessarily transferred, and before the close of the war this state stood, as it were, the mistress of Greece.

Persia at this time was the chief power of the world, and, by the conquest of the Lydian kingdom, had become master of the Greek cities on the coast of Asia Minor. In 500 B. C. a general revolt of these Ionian cities took place, and the Athenians sent a force of ships and soldiers to help their kinsmen. The united Ionians and Athenians took and burned Sardis, the capital of Lydia, in 499, but, after a six years' struggle, the power of Darius conquered the whole seaboard of Ionia, and left Persia free to punish the Athenians for interfering between the great Eastern empire and her revolted subjects. In 490 B. C. a great Persian force, under Datis and Artaphernes, was sent across the Ægean, and the fleet landed the Persian army near Marathon, on the east coast of Attica, with a view to an advance upon Athens.

THE FAMOUS BATTLE OF MARATHON

The first and most important battle of the Persian War, and one of the most momentous in history, was that of Marathon. At the plain of Marathon, near Athens, a small Athenian force of about ten thousand men (with the help of six hundred men from Platæa), under the famous general Miltiades, routed a Persian army of perhaps one hundred and ten thousand, in 490 B. C. This memorable battle, resulting as it did in the defeat of the power which had conquered the greater part of the known world, first taught the Greeks their own strength and gave Athens a position in Greece which it had never yet held. The leading men in Athens at this time were Themistocles and Aristides.

The death of Darius, in 485 B. C., prevented him from renewing the Persian attack on Greek

liberties, and the task was bequeathed to his son Xerxes. The invasion of Greece by Xerxes took place ten years after the battle of Marathon with an immense force by sea and land (two million five hundred thousand men according to Herodotus).

STAND OF THE THREE HUNDRED AT THERMOPYLAE

Then was fought the memorable battle of Thermopylæ (gates of the hot springs, from hot springs situated there), in which the Spartan Leonidas with a mere handful of men held the whole Persian army at bay in the narrow pass of Thermopylæ; but, a way around the pass being shown the Persians by a treacherous Greek, they were able to attack Leonidas in the rear. Part of the Greek forces retreated on learning of this movement of the Persians, but Leonidas with three hundred Spartans and seven hundred Thespians refused to retreat, and, advancing against the overwhelming numbers of the enemy, sold their lives as dearly as possible.

This little remnant of the Greeks, armed only with a few swords, stood a butt for the arrows, the javelins, and the stones of the enemy, which at length overwhelmed them. Where they fell they were afterwards buried.

GREEK VICTORY AT SALAMIS

Xerxes, having taken the pass of Thermopylæ, moved towards Athens, when the inhabitants had fled, taking refuge in their ships, according to their interpretation of a decree of the oracle that they must seek safety in their "wooden walls." The Persians burned Athens, and the fate of Greece was then decided by the naval battle of Salamis (480 B. C.), which resulted in a complete victory for the Greeks.

The battle of Salamis, with the battles of Platæa and Mycale, in the next year, decided the war, and the Persians were driven out of Greece forever, and finally, after several years, were driven wholly out of Europe. The arbitrary rule of an irresponsible despot was overcome by the spirit of voluntary obedience to law, the freedom of Greece was maintained, and the future civilization of Europe was secured.

IV. AGE OF PERICLES AND GREEK LUXURY.—This period includes the portion from the close of the Persian war to the Supremacy of Philip, B. C. 337. At the beginning of this period the general affairs of Greece were in a highly prosperous condition, and Athens was unrivaled in wealth and magnificence under the influence of Pericles. But a spirit of luxurious refinement soon took the place of the disinterested patriotism of the preceding age, and the manners of all classes became signally marked by corruption and licentiousness. The events of most prominent interest were: (1) the Peloponnesian war between Athens and Sparta; (2) the accusation of Socrates, disgraceful to the city and all concerned; (3) the expedition of Cyrus the Younger which involved the Greeks in another war with Persia; (4) the successive downfall of Athens, Sparta and Thebes, and the rise of Macedon.

The half-century following the battle of Salamis (480-430 B. C.) forms the most brilliant period of Athenian history, and one of the greatest eras in the history of the world.

ATHENS UNDER CIMON

After the fall of the great Athenian Themistocles,—who was banished by ostracism in 469 B. C., at the instance of the aristocratic party,—the rich, able, and popular Cimon, son of Militiades, the victor at Marathon, was at the head of affairs. In 466 B. C. he gained a great victory, by land and sea, over the Persians, at the mouth of the river Eurymedon, in Pamphylia, on the south coast of Asia Minor. A part of the value of the plunder taken was devoted to the adornment of the city of Athens, which Themistocles had rebuilt and fortified. Cimon spent large sums of his own on the city, and under his direction the defenses of the famous Acropolis (the citadel of Athens) were completed. In 461 B. C. the democratic party at Athens banished Cimon by the ostracism, and the illustrious Pericles, for some years his rival, came to the front.

PERICLES AND HIS GREAT ACHIEVEMENTS

Pericles began to be distinguished in Athenian politics about 470 B. C. as leader of the democratic party.

In the constitution of Athens a wide scope was given for the development of great political characters, because the system not only allowed the display of a man's powers, but summoned every man to use those powers for the general welfare. At the same time, no member of the community could obtain influence unless he had the means of satisfying the intellect, taste, and judgment, as well as the excitable and volatile feelings, of a highly cultivated people.

Such a man was Pericles. From the force of his personality, and his majestic oratory, he was called "the Zeus of the human Pantheon of Athens." For over thirty years (461 to 429 B. C.) this great man swayed the policy of Athens. Pericles was at once a statesman, a general, a man of learning, and a patron of the fine arts. He recovered for Athens (445 B. C.) the revolted island of Eubœa; he was the friend of the famous sculptor Phidias, and in his age the great dramatic compositions of Sophocles were presented on the Athenian stage. To him Athens owed the Parthenon, the Erechtheum, left unfinished at his death, the Propylæa, the Odeum, and numberless other public and sacred edifices; he also liberally encouraged music and the drama; and during his rule industry and commerce were in so flourishing a condition that prosperity was universal in Attica.

THE PELOPONNESIAN WAR

The supremacy over the other states of Greece which Athens attained after the Persian War, and maintained during the Age of Pericles, with her constant prosperity and unparalleled growth, raised up jealousy and hatred against her, and during that brilliant period were sown the seeds of a civil warfare which was destined to destroy the power and splendor of Greece. After the death of Pericles, Athens had trusted to unworthy demagogues, of whom the most notorious was Cleon.

The other leading state of Greece was Sparta, and there was a general gravitation in the different cities to these two centers of Grecian life, those in which democratic sentiments pre-

Pinakotheka, or Museum of Pictures. Propylæa, or Porch. Nike Apteros. Parthenon, or Temple of Athena Parthenos.

THE ACROPOLIS OF ATHENS AS IT APPEARED DURING THE AGE OF PERICLES

Pericles, with the sculptor Phidias, covered the Acropolis with a mass of beautiful buildings, making it the glory of Athens, if not of the whole ancient world. No finer structure has even been known than the Parthenon. It is to be seen on the highest point of the Acropolis, on the right hand of the picture.

vailed looking to Athens for leadership, the rest (those in which the aristocratic or oligarchical element prevailed) regarding themselves as the natural allies of Sparta. The conflict between these two opposing principles, democracy and oligarchy, broke out in 431 B. C., and is known as the Peloponnesian War. Athens was the stronger by sea, Sparta by land.

CHIEF LEADERS IN THE WAR

The chief generals on the Athenian side were Demosthenes (not the great orator of a later time) and Nicias; the Spartan chief was the famous Brasidas, who had much success against the Athenian colonies on the coast of Thrace. The brilliant Alcibiades began to display his powers as a statesman at Athens. In 422 B. C. a battle near Amphipolis, on the coast of Thrace, ended in the defeat of the Athenians, and the deaths of Cleon and of Brasidas, the latter an irreparable loss to Sparta. In the place of Cleon, the mild Nicias became one of the leading statesmen at Athens, and his efforts resulted in a truce between Athens and Sparta, in 421 B. C.

SECOND PERIOD OF WAR

Questions as to keeping the truce, and the mutual distrust and jealousy between these states increased their antagonism. Athens, now mistress of the sea, had the ambition, under the incitement of the great Alcibiades, to acquire complete sway in the Mediterranean.

Perhaps the most important and decisive event of the war was an attack made (415 B. C.) by Athens upon Syracuse in Sicily, when the Spartans helped the Syracusans, and which resulted in the total failure of the expedition (413 B. C.), and great damage to the power of Athens. The Athenians had sent a more powerful armament against Sicily than had ever before been turned out in the history of Greece. The consequences of the defeat of this force were felt all over Greece, the enemies of Athens were stimulated to much greater activity, and thought that the fate of that city was sealed.

THIRD AND LAST PERIOD

Henceforward Athens could only fight for her life as an independent state. In 412 B. C. many of her subject states revolted, including the wealthy Miletus, on the coast of Asia Minor, and the islands of Chios and Rhodes. Sparta formed an alliance with Persia, and used Eastern gold to furnish ships and mercenaries against Athens. Alcibiades, having quarreled with the Spartans, rejoined his country, and conducted her war, in some of its closing years, with brilliant success. In 411 B. C. a revolution took place in Athens which really swept away the democratic constitution of Solon, and substituted an oligarchical faction in power.

DOWNFALL OF ATHENS

The war was chiefly carried on in Asia Minor, where Alcibiades and others defeated the Spartans and their allies by land and sea; but in 405 B. C. the tide of success for Athens turned again, and the Athenian fleet was captured by the Spartan admiral Lysander, at Ægospotami, in the Hellespont, the Athenian galleys being seized, by surprise, on the beach. In 404 B. C. Athens, blockaded by the Spartans both by land and sea, surrendered to Lysander after a four months' siege, and the war ended in the downfall of Athens, and the formal abolition of the great Athenian democracy.

RESULT OF PELOPONNESIAN WAR

Henceforward Athens was a subordinate power. Sparta was, for a time, supreme; a Spartan garrison held the Acropolis; Alcibiades, who might have restored Athens, was assassinated in Persia through the influence of Lysander; and though, after a brief period of rule by the Thirty Tyrants, set up by Lysander, a counter-revolution restored, in part, the constitution of Solon, the political greatness of Athens had departed.

Even the disastrous Peloponnesian War, which lasted twenty-seven years, did not destroy the impulse given to the Greek intellect during the preceding age, and literature, oratory, and philosophy flourished.

SOCRATES AND THE SHAME OF ATHENS

Socrates, the great and good Athenian philosopher, lived (469-399 B. C.) during a period covering much of the age of Pericles, and the whole time of the Peloponnesian war. Though opposed to the oligarchical tyranny of the Four Hundred and the Thirty, Socrates was even more adverse to the unmixed democracy, with its election by lot and its payment for political services. Accordingly, on the triumph of the demagogues, he was in 399 B. C. accused of denying the gods and corrupting the young, and being convicted by an overwhelming majority of the jury, was sentenced to death. He passed thirty days before execution in the noble discourses on the immortality of the soul, which are recorded in Plato's Phædo, drank the cup of hemlock, and died.

SUPREMACY OF SPARTA AND THEBES

Sparta was now at the head of Greece, and for thirty-four years (405-371 B. C.) wielded power over the Greek states. Her sway was harsh and despotic.

RETREAT OF THE TEN THOUSAND

After the Peloponnesian War, some of the Greeks were hired by Cyrus, the Persian prince, to help him in an attempt to wrest the Persian throne from his brother Artaxerxes. The attempt failed, and the memorable retreat (400 B. C.) homeward of the Greeks is famous as the "Retreat of the Ten Thousand."

THE RISE OF MACEDONIA

Macedonia, north of Thessaly, was not considered by the Hellenes as a part of Hellas, and had no political importance till now. Yet the peoples had elements in common, being Thracians and Illyrians, with a large mixture of Dorian settlers among them.

KING PHILIP OF MACEDON

The line of Macedonian kings being of Hellenic descent, Greek civilization had been cultivated by some of them.

Philip of Macedon was a prince of great ability, educated at Thebes during the Theban

supremacy, and trained in war by Epaminondas, on whose tactics he founded his famous invention, the "Macedonian phalanx." His fame has been overshadowed by that of his illustrious son, but he made Macedonia the leading power in Greece, and gave Alexander the basis for his great achievements. He was a man of unscrupulous character, determined will, prompt action, and patient purpose; and when he became King of Macedon, in 359 B. C., he designed making his country supreme in the Hellenic world, as Athens, Sparta and Thebes had successively been.

THE FIRST SACRED WAR

From 356 B. C. to 346 B. C. the Phocian or First Sacred War was waged between the Thebans and the Phocians, with allies on each side, the origin of the war being a dispute about a bit of ground devoted for religious reasons to lying perpetually fallow. Philip of Macedon was called in to settle matters, and thereby his ambition secured a firm foothold in Greece. He possessed himself by force of the Athenian cities Amphipolis, Pydna, Potidæa, and Olynthus, being vigorously opposed throughout by the great Athenian orator and patriot Demosthenes, who strove to rouse his countrymen against Philip's dangerous encroachments, in the famous speeches known as the Olynthiac and Philippic orations.

THE GREATEST PERIOD OF GREEK ORATORY

This was the most brilliant time of Greek oratory, which reached its perfection in the contest between Æschines, who advocated the cause of Macedonia, and Demosthenes, who opposed the designs of Philip. It was also a period of great mental activity in the region of scientific inquiry and speculative thought. Plato, whose birth fell in the preceding century, founded the Academic school, which took its name from the groves of Academus in the vicinity of Athens, where the philosopher was accustomed to lecture. Aristotle (called the Stagyrite, from his birthplace, Stagyra, in Macedonia) was the instructor of Alexander the Great, and founded, at the Lyceum in Athens, what is known as the Peripatetic school, from his habit of walking about while conversing with his disciples.

After the battle of Chæronea, Philip, having made Greece subject to his power, planned to unite all the forces of that country in an aggressive war against the great power of Persia, but was murdered in 336 B. C.

V. MACEDONIAN PERIOD AND EMPIRE OF ALEXANDER THE GREAT.—This period extends from the supremacy of Philip, gained by the battle of Chæronea, to the capture of Corinth, 146 B. C. By the disastrous defeat at Chæronea the genuine fire of the Grecian spirit was extinguished, and the subsequent history exhibits little else than the steps by which the country was reduced to a dependent province. Alexander, who succeeded his father Philip, as king of Macedon, and autocrat of Greece, cast an imperishable glory on the first years of this period by his extensive conquests reaching from the Hellespont to the Granicus, to Issus, to Tyre, to the Nile, to the desert of Libya, to the Euphrates, and the Indus. For twenty years after Alexander's death the vast empire he had formed was agitated by the quarrels among his generals. By the battle of Ipsus in Phrygia, B. C. 301, these contests were terminated, and the empire was then divided into practically four kingdoms. To the first of these the Grecian states belonged. Patriotic individuals sought to arouse their countrymen to cast off the Macedonian yoke; but jealousy between the states and the universal corruption of morals rendered their exertions fruitless. All that is really memorable in the affairs of Greeks at this later time, is found in the history of the Achæan league.

After the assassination of Philip, the task of subjugating the Persian Empire was left for his son Alexander, who subsequently proved himself one of the greatest commanders of any age. Alexander's exploits were all performed in the short rule of thirteen years (336-323 B. C.). Coming to the throne of Macedon at the age of twenty, he put down rebellion in his own kingdom, marched into Greece and overawed Thebes, which had been intriguing against him, and in a congress of Greek states at Corinth he was appointed to command the great expedition against Persia.

THE DESTRUCTION OF THEBES

In 335 B. C. he made a successful expedition against the Thracians, Getæ, and Illyrians, and on his return found Thebes in revolt. He took Thebes by storm; the inhabitants were all slain or sold as slaves; and all the buildings, except the temples and the house which had been that of Pindar the poet, were razed. This capital had defied Alexander, and ceased to exist.

ALEXANDER'S INVASION OF PERSIA

In 334 B. C. Alexander crossed the Hellespont with an army of thirty thousand footsoldiers and five thousand cavalry, and first met the foe at the river Granicus, in Mysia. The result was a Persian defeat, which cleared the way through Asia Minor, and brought the Macedonians to the borders of Syria. The second, a great battle (333 B. C.), was fought at Issus, in the southeast of Cilicia. There Alexander met the King of Persia himself, Darius III., and gained a complete victory over a vastly superior force. Darius fled, leaving his wife and mother prisoners in the conqueror's hands, by whom they were treated with the greatest courtesy and kindness.

SYRIAN AND EGYPTIAN CAMPAIGNS

The Persian resistance thus disposed of for a time, Alexander turned southward, left behind him nothing unsubdued before his advance into the interior of Asia, and made an easy conquest of the cities of Phœnicia, except Tyre, which resisted obstinately for seven months, and was taken in the summer of 332 B. C. After taking Gaza, Alexander marched into Egypt, which received him gladly, from hatred of her Persian rulers. Early in 331 B. C. the Macedonian king handed down his name to future ages by founding, at the mouth of the western branch of the Nile, the city of Alexan-

dria, which was destined to become so famous for commerce, wealth, literature, and learning.

ALEXANDER'S SECOND INVASION OF PERSIA

In the spring of 331 B. C. Alexander set out again for Persia, where Darius had been gathering an immense force with which to make a last struggle for the empire of the world. After traversing Phœnicia and Northern Syria, Alexander crossed the Euphrates and Tigris, and came out on the plain near the little village of Gaugamela, to the southeast of the ruins of Nineveh. Then took place the great and decisive battle of Arbela, with the Persians, October, 331 B. C.

After receiving the surrender of the other two capitals, Susa and Persepolis, Alexander spent the year 330 B. C. in conquering the northern provinces of the Persian Empire, between the Caspian Sea and the Indus. In 329 B. C. he marched into Bactria, over the mountains now called the Hindu Kush, caught and slew the traitor Bessus, who murdered Darius, and advanced even beyond the river Jaxartes. In 328 he was engaged in the conquest of Sogdiana, between the Oxus and Jaxartes, the country of which the capital was Maracanda, the modern Samarcand.

HIS INVASION OF NORTHERN INDIA

In the spring of 327 B. C., Alexander marched through what is now Afghanistan, crossed the Indus, and defeated an Indian king, Porus, on the banks of the Hydaspes (the Jhelum). On his way to the Indus he stormed the capital of an Indian tribe, now Mooltan, and was himself severely wounded. In 326 he sailed in a fleet, built on the spot, down the Indus, into the ocean; despatched a part of the army on board the ships, under his admiral Nearchus, by sea coastwise into the Persian Gulf, and marched himself with the rest through what is now Beluchistan, reaching Susa early in 325 B. C.

ALEXANDER SETTLES IN BABYLON

During the rest which the troops took here, Alexander, many of his generals, and many thousands of his soldiers, married Asiatic women, and, with the same view of bringing Europe and Asia into one form of civilization, great numbers of Asiatics were enrolled in the victorious army, and trained in the European fashion. For the improvement of commerce, the Tigris and Euphrates were cleared of obstructions. From Susa, in the autumn of 325 B. C., Alexander visited Ecbatana (in Media) and thence proceeded to Babylon, which he entered again in the spring of 324 B. C.

It was the intention of Alexander to make Babylon the capital of the empire, as the best medium of communication between east and west; and he is said to have meditated the conquests of Arabia, Carthage, Italy, and of Western Europe. For commercial and agricultural purposes he intended to explore the Caspian Sea, and to improve the irrigation of the Babylonian plain. All his plans were made vain by his sudden death by fever at Babylon, in the summer of 323 B. C.

ESTABLISHMENT OF VARIOUS GREEK KINGDOMS

Alexander the Great left no heir to his immense empire. In Bactria (the modern Bokhara), Asia Minor, Armenia, Syria, Babylonia, and above all in Egypt, Greek kingdoms were established as centers of science, art, and learning, from which Greek light radiated into the world around them. In Europe, besides that of Macedon, a kingdom of Thrace, stretching beyond the Danube, another in Illyria, and another in Epirus, were under the rule of Greek princes. To Alexander the world owed, among other great cities built by him or his successors, Alexandria in Egypt, and Antioch in Syria.

LASTING INFLUENCE OF GREEK THOUGHT IN ASIA

The Greek language became the tongue of all government and literature throughout many countries where the people were not Greek by birth. Throughout Asia Minor, Syria, and Egypt the Hellenic character that was thus imparted remained in full vigor down to the time of the Mohammedan conquests; and the early growth and progress of Christianity were aided by that diffusion of the Greek language and civilization.

Beyond the Euphrates, Grecian influences largely modified Hindu science and philosophy and the later Persian literature. The intellectual influence of ancient Greece, poured on the Eastern world by Alexander's victories, was brought back to bear on Mediæval Europe through the Saracenic conquests. The learning and science of the Arabians, communicated at that epoch to the western parts of Europe, were merely the reproduction, in an altered form, of the Greek philosophy and the Greek learning acquired by the Saracenic conquerors along with the territory of the provinces which Alexander had subjugated, nearly a thousand years before the armed disciples of Mohammed began their career in the East.

ALEXANDER'S SUCCESSORS

On the death of Alexander, in 323 B. C., a struggle of more than twenty years' duration ensued among his principal generals and their heirs—Perdiccas, Ptolemy, Antigonus, his son Demetrius Poliocetes, Cassander, Seleucus, and others. At last, in 301 B. C., a decisive battle was fought at Ipsus, in Phrygia, between Antigonus (with his son Demetrius) and a confederacy of his rivals. The result was to distribute the provinces of Alexander's empire in the following way: To Lysimachus, nearly the whole of Asia Minor; Cassander, Greece and Macedon; Seleucus, Syria and the East; Ptolemy had Egypt and Palestine. The two most important kingdoms were that of the Ptolemies in Egypt, and that of the Seleucids* in the East. (See further under Comparative Outlines, and Egypt.)

*The Syrian monarchy of the Seleucidæ began in 312 B. C. with Seleucus I. (surnamed Nicator), one of Alexander's generals, and under him was extended over much of Asia Minor, including the whole of Syria from the Mediterranean to the Euphrates, and the territory eastwards from the Euphrates to the banks of the Oxus and the Indus. Seleucus I. was an able and energetic monarch, and

LATER HISTORY OR MACEDONIA AND GREECE

The last period in the history of Greece presents us with long wars among different successors of Alexander for the sovereignty of the Greek states, and factions and intrigue rife in and between the different communities. From time to time great and patriotic men arise, making a struggle glorious but vain for the restoration of political freedom and the spirit of the olden time. We find "leagues" and confederations formed in order to resist the coming doom of political extinction.

THE FATAL LAMIAN WAR

A great effort to free Greece from the Macedonian supremacy was headed by Athens in 323 B. C. The renowned Athenian orators Demosthenes and Hyperides were its political heroes, opposed by Phocion, a man of pure character, but who despaired of a successful rising against Antipater, ruler of Macedonia before and after Alexander the Great's death. Athens was joined by most of the states in Central and Northern Greece; and the war derives its name from Lamia in Thessaly, where Antipater, after being defeated by the confederates, was besieged for some months. The war ended in 322 B. C., by Antipater's complete victory at the battle of Crannon in Thessaly. Demosthenes ended his life by poison in the same year; Hyperides was killed by Antipater's orders; Phocion died by the hemlock at Athens, in 317 B. C., on a charge of treason.

HEROIC EFFORTS OF DEMETRIUS

The distinguished Demetrius Poliorcetes (besieger of cities) was king of Macedonia from 294 to 287 B. C. His life was passed in fighting with varied success and he was driven from the throne at last by a combination of enemies, including the famous Pyrrhus, king of Epirus. Demetrius was a man of wonderful abilities and resources, deriving his surname from the enormous machines which he constructed for the siege of Rhodes, one of his warlike enterprises. He freed Athens for a time from Macedonian domination before he became ruler of Macedon.

A famous personage was Pyrrhus, the warlike king of Epirus, the territory in the northwest of Greece, inhabited by descendants of the old Pelasgians and Illyrians. The first king of the whole country was Alexander, the brother of Olympias, mother of Alexander the Great. He ruled from 336 to 326 B. C.

THE WARRIOR PYRRHUS, KING OF EPIRUS

Pyrrhus (295 to 272 B. C.) is renowned as the greatest warrior of his age. He had been driven by his subjects from Epirus, but, assisted with a fleet and army by Ptolemy I. of Egypt, returned thither and began his actual reign in 295 B. C. His first efforts were turned against Macedonia; but, after much fighting, he lost his hold there, in 286 B. C. It was in 280 B. C. that he began his great enterprise by crossing over into Italy, to aid the Tarentines against the Romans. In his first campaign he defeated the Romans in the battle of Heraclea in Lucania. His skill was aided by a force of armored elephants, and by the Macedonian formation of the phalanx, both novelties to the Romans. In the second campaign (279 B. C.) Pyrrhus gained a second dearly bought victory over the Romans at Asculum, in Apulia, yet with no decisive result; in 278 B. C. he crossed into Sicily, to help the Greeks there against the Carthaginians.

REPULSES AND DEATH OF PYRRHUS

At first he was very successful and defeated the Carthaginians, taking the town of Eryx; but he failed in other operations, and returned to Italy in 276 B. C., again to assist the Tarentines against the Romans. In 275 B. C. his career in Italy was closed by a great defeat, inflicted by the Romans at the battle of Beneventum, and Pyrrhus returned to Epirus with the remnant of his army. In 273 B. C. he invaded Macedonia with such success as to become king, and his restless spirit then drove him to war in Peloponnesus. He was repulsed in an attack on Sparta, and, after entering the city of Argos to assist one of its factions, was knocked from his horse by a heavy tile hurled from a house-top by a woman's hand, and killed by the enemy's soldiers. Thus died Pyrrhus, in the forty-sixth year of his age, and the twenty-third of his reign,—a man of the highest military skill, capable of great enterprises, but without the steady resolution and the practical wisdom to bring them to a successful issue.

GALLIC INVASION OF GREECE

The Gauls invaded Greece in 280 B. C. After penetrating through Macedonia and Thessaly they were defeated under their leader Brennus (namesake of the captor of Rome a century earlier), near Delphi in Phocis. Some of the Gauls in this irruption made their way into Asia Minor, and ultimately gave their name to the province Galatia, adopting the Greek customs and religion, but keeping their own language.

THE CELEBRATED ACHAEAN LEAGUE

The Achæan League was founded, in its new form, in 280 B. C., consisting of the towns in

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sedulously carried out the plans of Alexander the Great. He died in 280 B. C., having founded the city of Antioch in Syria as the capital of the kingdom. His successors, the dynasty known as the Seleucidæ (or "descendants of Seleucus"), ruled for about two centuries. The most notable of these monarchs were named Antiochus.

The third of the name, Antiochus the Great (223 to 187 B. C.), was the monarch at whose court Hannibal, the great Carthaginian, took refuge. Antiochus invaded Greece in 192 B. C., and there the Romans defeated him both by land and sea, and compelled him to yield a large part of his dominions in Asia Minor. Much of the eastern territory had been lost before this time, as well as Phœnicia, Palestine, and Western Syria, conquered by Ptolemy Philopator, king of Egypt.

Antiochus Epiphanes (175-164 B. C.) oppressed the Jews to introduce the worship of the Greek divinities. Against him the brave Maccabees rose in rebellion. The Syrian kingdom ended in 65 B. C., conquered by the Romans under Pompey.

Achæa, and afterwards including Sicyon, Corinth, Athens, and many other Greek cities, so that it became the chief political power in Greece. In 245 B. C. Aratus (sometimes called the "last of the Greeks") became head of the league, and much extended its influence by skillful diplomacy. Philopœmen, another distinguished man of this period, general of the league in 208 B. C., and again in 201 and 192 B. C., was successful in battle against the Spartans when they assailed the League, and in 188 B. C. took Sparta, leveled the fortifications, and replaced the institutions of Lycurgus by the Achæan laws.

Greece from this time forward was greatly distracted; Greek power, Greek energy, Greek genius, might now be found indeed anywhere rather than in Greece. The Achæan League from time to time made spasmodic efforts, but Rome constantly interfered in Greek affairs. Domestic faction helped Roman intrigues, and the battle of Pydna (in Macedonia), gained by the Romans in 168 B. C. over Perseus, the last king of Macedon, formally ended the dominion established by Phillip II., nearly two centuries before. Macedonia was made a Roman province in 147 B. C.

GREECE BECOMES A ROMAN PROVINCE

The Achæan League had gradually languished and in 150 B. C. war with Rome began, as a last effort on behalf of Greece. It ended in the defeat of the forces of the League by the Roman general Mummius, and the capture of Corinth (146 B. C.), which was plundered, and burned to the ground; the Achæan League was formally dissolved, and Greece was made into the Roman province Achaia, in 146 B. C. The city of Athens was allowed to retain a kind of freedom, and became, along with Alexandria, a university town of the civilized world, in which students of art, philosophy and literature found the best models, the best instruction, and the highest inspirations.

THE GREEKS UNDER FOREIGN RULE UNTIL 1832

Under the Romans Greece was at first treated fairly well, and much of the old municipal life was left. Hellenic culture fascinated the conquerors. Greek teachers poured into Rome, and Athens became the university for wealthy Roman youths. Little by little, however, the government became more oppressive. In the Mithradatic War the Greeks rose in a revolt which led to a devastating march of Sulla across the country and to the storming of Athens and the massacre of its inhabitants. Greece was then exposed to the exactions of the Roman officials on the one hand, and to the ravages of pirates on the other. In 267 A. D. the Goths swept across the land, destroyed many towns, and captured Athens, from which they were dislodged by the forces of the historian Dexippus.

In internal affairs the tendency during the following centuries was to more and more centralize rule on the part of the Romans. The Emperor Hadrian attempted to improve the condition of the Greeks by giving them rights equal to those of Roman citizens, by reforming the administration of justice, and by paying attention to roads and buildings. Constantine, the first Christian Emperor, took the important step of changing the capital from Rome to Byzantium, which he solemnly dedicated in 333 A. D. and called, after himself, Constantinople. The Emperor, having been the political head of the pagan religion, naturally assumed the same direction of the Christian faith, and, in the opposition of the orthodox Church to the Arianism of the first Christian Emperors the people found a vent for the national feeling which chafed against the despotism of an alien court. Theodosius the Great (378-395) first established Christianity as the religion of the state. His sons, Arcadius and Honorius divided the Roman dominions between themselves, and Constantinople became the capital only of the Eastern Empire. At this time a great danger threatened Greece from Alaric, king of the West Goths, who invaded Greece in 396 and occupied Athens. Though the city and country were pillaged by the Goths, Alaric strictly protected the honor of Greek women and religious edifices.

GREECE UNDER THE BYZANTINE EMPIRE

On the division of the Roman Empire, Greece fell of course to the eastern or Byzantine half. In 1204 the Crusaders and Venetians captured Constantinople, and divided the Empire—an act which has been taken as the end of "the Byzantine Empire." Baldwin, Count of Flanders, was elected Emperor of Roumania, and reigned at Constantinople. Many new states sprang out of the partition, and new empires were founded at Nicæa, Trebizond, and Thessalonica. The feudal system was established in Greece. Athens became a fief of Roumania, governed by dukes; a great part of the Peloponnesus was kept first by Franks and then by Neapolitans, as the Principality of Achæa. The Venetians obtained possession of most of the islands.

Of all the confused and crowded events of these times probably the most important was the capture of Constantinople in 1261 by Michael Palæologus, Emperor of Nicæa, but no attempt to hold Greece could long endure in the face of the Ottoman Turks who soon began to threaten from the East. In 1453 the Sultan Mohammed II. took Constantinople. The Venetians finally surrendered all claim to most of their Greek possessions by the Treaty of Passarowitz in 1718.

UNDER TURKISH RULE DOWN TO THE WAR OF GREEK INDEPENDENCE

During the rule of the Turks the Greeks endured many hardships, including a curious tribute of children, who were educated by Mohammedans and trained for service in the corps of Janissaries. It was, however, to the interest of the Sultans for the sake of their revenues to encourage Greek commerce, and so there were wealthy classes with culture enough to make a fruitful soil for the teaching of the French Revolution. The spirit thus implanted led to the War of Greek Independence in 1821—memorable for the generous sympathy of Byron, for the long siege of Missolonghi, and for the accident which led to the defeat of the Turkish fleet at Navarino in 1827 by English, French, and Russian vessels.

From this period down to the present the history of Greece belongs to the modern kingdom.

ALARIC, KING OF THE WEST GOTHS, IN ATHENS *From the Painting by LUDWIG THIERSCH*

Though Alaric was a fierce warrior and ruthless in his attacks in both Greece and Rome, he held the women and the religious temples of the places overrun with the strictest sanctity. This was in strong contrast with the social and political corruption of the time in both Greece and Rome and did much to justify this powerful conqueror of a decadent state.

ROME: MISTRESS OF THE WORLD

IMPORTANCE OF ROMAN HISTORY

THE greatness of Roman history lies in the fact that it is, in a large sense, the history of the world from the time of Rome's supremacy. Out of the Roman Empire arose the modern state system of Europe; and the Roman language, law and institutions are still, in changed forms, alive and active in the modern world. The influence of Christianity, and of Greek art and literature, have to a great extent been preserved and transmitted to us through Rome. Rome brought all the civilized peoples of the West, including Western Asia, under one dominion and one bondage; and the culture which was thus gathered up into one vast reservoir was given off in streams that, in due season, fertilized the mental soil of the rude and restless nations which succeeded the fallen empire.

GEOGRAPHICAL CENTER OF THE ROMAN EMPIRE

THE STUDY OF Roman history properly begins with the geography of Italy, because it was in Italy that the Roman people had their origin, and it was here that they began their great career. It was only when the Romans had conquered and organized Italy that they were able to conquer and govern the world.

FAVORABLE SITUATION OF THE ITALIAN PENINSULA

The position of the Italian peninsula was favorable to the growth of the Roman power. It was situated almost in the center of the Mediterranean Sea, on the shores of which had flourished the great nations of antiquity—Egypt, Phœnicia, Carthage and Greece. By conquering Italy, Rome thus obtained a commanding position among the nations of the ancient world. As the peninsula projects southward into the Mediterranean it bends toward the east, so that its southern coasts afforded an easy access to the civilized peoples of Greece. The eastern shores of the peninsula, washed by the Adriatic Sea, with few bays and harbors, were not favorable to the early progress of the people; while the western coasts, bordering upon the Tyrrhenian Sea, with their numerous indentations afforded greater opportunities for commerce and a civilized life.

THE MOUNTAINS AND RIVERS OF ITALY

There are two important mountain chains which belong to Italy, the Alps and the Apennines. The Alps form a semicircular boundary on the north and afford a formidable barrier against the neighboring countries of Europe. Starting from the sea at its western extremity, this chain stretches toward the north for about one hundred and fifty miles, when it rises in the lofty peak of Mt. Blanc, fifteen thousand feet in height; and then continues its course in an easterly direction for about three hundred and thirty miles, approaching the head of the Adriatic Sea, and disappearing along its coast. It is crossed by several passes, through which foreign peoples have sometimes found their way into the peninsula.

The Apennines, beginning at the western extremity of the Alps, extend through the whole length of the peninsula, forming the backbone of Italy.

IMPORTANT DIVISIONS OF THE PENINSULA

Central Italy comprised the northern part of the peninsula proper, that is, the territory between the line just drawn from the Macra to the Rubicon, and another line drawn from the Silarus on the west to the Frento on the east. This territory contained six countries, namely, three on the western coast,—Etruria, Latium (*la'shi-um*), and Campania; and three on the eastern coast and along the Apennines,—Umbria, Picenum, and what we call the Sabellian country, which included many mountain tribes, chief among which were the Sabines and the Samnites.

Southern Italy comprised the rest of the peninsula and contained four countries, namely, two on the western coast, Lucania and Brutium, extending into the toe of Italy; and two on the eastern coast, Apulia and Calabria (or Iapygia), extending into the heel of Italy.

EARLY INHABITANTS OF SICILY

Sicily was inhabited in the west by a race of unknown origin called the Sikanians: the Sikels, who gave their name to the island, were closely connected in race with the Latins. Sicily was

fought for by the Carthaginians, and, Greek cities having been founded in Sicily, in the end the island became almost wholly Greek in speech and usages.

THE GAULS OF NORTHERN ITALY

If the Greeks in the extreme south were the most civilized people of Italy, the Gauls or Celts, in the extreme north, were the most barbarous. Crossing the Alps from western Europe, they had pushed back the Etruscans and occupied the plains of the Po; hence this region received the name which it long held, Cisalpine Gaul. From this land the Gauls made frequent incursions toward the south, and were for a long time a terror to the other peoples of Italy.

HISTORY OF THE ROMANS

I. MYTHICAL PERIOD.—The history of Rome extends through a space of more than twelve hundred years, which may be divided into *six* periods. The first period includes the time from the building of the city, B. C. 752, to the expulsion of Tarquin, B. C. 509. It may be called the period of the kings, or of *Regal Power*.

The Roman historians have left a particular account of this period, beginning with the very founders of the city, Romulus and Remus, whose descent is traced from Æneas the hero of Virgil. To review them briefly here will be all that is necessary.

Æneas, fleeing from Troy after the fall of that city, came, in the course of his wanderings and after many adventures, to the shores of Italy. Settling here, he married the daughter of the king Latinus, and after a fierce war with Turnus, his rival for the hand of Lavinia, he established himself in Latium. The capital of that country, Alba Longa, was founded by his son, Ascanius, and for three centuries the descendants of Æneas ruled the country.

In the eighth century B. C., Amulius usurped the throne but failed to kill his grand-nephews Romulus and Remus, who, by the fortuitous aid of the gods, were rescued from death. Growing to manhood, they destroyed the usurper and restored their grandfather, Numitor. Romulus then founded the city of Rome in 753 B. C., populated it by means of inviting all the discontented to come unto him, and gave them wives from the Sabine tribes, which incident has passed into history as the Rape of the Sabines. To this same incident in Roman mythology belongs the legend connected with the Tarpeian Rock. Romulus finally was taken to the gods by his father, Mars, and is henceforward worshiped by the Romans as the god Quirinus.

THE GOOD KING NUMA

The reign of the second king, Numa, is remembered, on account of his influence on the affairs of religion. He instituted many of the religious ceremonies and several classes of priests, and was regarded as the founder of the religious institutions of Rome.

During the reign of the third king, Tullus Hostilius, a war was carried on with Alba Longa. The issue of this war was decided, so the story goes, by a combat between the three Horatii, champions of the Romans, and the three Curiatii, champions of Alba—resulting in the triumph of the Romans and the submission of Alba to the Roman power.

The fourth king, Ancus Marcius, was a Sabine, the grandson of Numa. He too was a man of peace, but was drawn into a war with several of the Latin cities. Having subdued them, he transferred their inhabitants to the Aventine hill.

LEGENDS OF THE LATER KINGS

The three later kings of Rome are represented as having been Etruscans. The first of these was Tarquinius Priscus, who migrated to Rome from the Etruscan city of Tarquinii. He strengthened his position as king by adopting the royal insignia of the Etruscans—a crown of gold, a scepter, an ivory chair, a purple toga, etc. He carried on war with the Latins and Sabines, drained the city, laid out the forum, and dedicated a temple to Jupiter on the Capitoline hill.

The next of the later kings was Servius Tullius, the son of a slave woman of the king's household. He united Rome and the Latin cities in a league; reorganized the government, and erected a new wall inclosing the seven hills.

Tarquin the Proud, the last king, was engaged in the siege of an enemy's city only sixteen miles from Rome, when his son committed the outrage upon the person of Lucretia, which led to the banishment of the family and the overthrow of the regal government.

II. PERIOD OF THE REPUBLIC, 510-264 B. C.—The second period extends from the expulsion of the kings to the beginning of the Punic wars. During this period the Plebeians were admitted to the offices of state, about 300 B. C. At the beginning of this period the government was a thorough aristocracy, but at the close of it has become a full democacy. It included about two hundred and fifty years, and may be designated the period of the Plebeian and Patrician contests, and the conquest of Italy.

When, at the close of the sixth century (509 B. C.), Rome ceased to be under kingly rule, it became a republic. Instead of a king, two magistrates called Consuls were elected every year. In other respects the constitution remained as before. The first consuls were Brutus and Collatinus.

As the city increased by immigration, and the admission of allies or incorporation of subjects, two principal classes of the citizens devel-

oped—the *Patricians* and *Plebeians*. The Patricians were probably those descended from the original citizens of the united Latin, Sabine, and Etruscan town, and the Plebeians the descendants of those afterwards admitted.

The internal history of Rome for several hundred years consists mainly of the account of struggles between these two orders. The Patricians alone were at first admissible to the great governing body, the Senate, and they kept in their hands all the high offices of state, the higher degrees of the priesthood, and the ownership of the public lands. The two orders were not allowed to intermarry, and the Plebeians, though they were free and personally independent (excepting compulsory service in war) had no political rights.

CAUSES OF STRUGGLES BETWEEN PATRICIANS AND PLEBEIANS

The struggles between the Patricians and Plebeians began about 500 B. C. The Plebeians fought the battles of Rome, and, in doing so, had to neglect the tillage of the soil by which they lived. Hence came poverty, made worse still by a severe law of debt, and by a high rate of interest extorted by the Patricians, who advanced money. The taxation of the state was paid solely by the Plebeians, as the Patricians had ceased to pay their rent to the treasury for the public lands which they held. At the same time, the Plebeians (which body included many men of birth and wealth) were entirely excluded from public offices. Such a state of things could only end in an outbreak, which occurred in 493 B. C.

FIRST WITHDRAWAL OF PLEBEIANS TO MONS SACER

The oppression of the debtors (who were imprisoned and flogged on failure to pay) caused a withdrawal of the Plebeians in a body to Mons Sacer (Holy Hill), outside the Roman territory, three miles from Rome. Their purpose was to erect a new town, and dwell apart, with equal rights. The Patricians, left helpless against foreign enemies, as usual in such cases, made concessions when forced to terms. It was agreed that two officials should be appointed (to offset the two consuls, who were Patrician magistrates) for the defense of the commoners against the cruel exercise of the law of debtor and creditor.

TRIBUNI PLEBIS

These new magistrates were called Tribuni Plebis (Tribunes of the Commons), and the title became very famous. They acted as champions of the subordinate class against all oppression, and pleaded in the law-courts on their behalf. The person of a Tribune was sacred and inviolable, and, in the exercise of his yearly office, he could forbid the execution of the order of any official, or of any decree of the senate; he could pardon offenses, and called to account all enemies of the commons under his charge.

FIRST OF THE AGRARIAN LAWS

In 486 B. C. Spurius Cassius (afterward tried for treason and put to death by the Patricians) carried the first of the famous Agrarian Laws, for limiting the amount of public land held by the Patricians, compelling them to pay tithe or rent for the land they held, and dividing surplus lands among the Plebeians. The law was not enforced, through the violence and injustice of the Patricians. The Plebeians exercised some check from time to time, by the refusal to serve as soldiers.

THE FAMOUS PUBLILIAN LAW

In 471 B. C. the Plebeians succeeded in carrying the famous Publilian Law (proposed by the tribune Publilius Volero), that the tribunes should in future be chosen only at the (popular) Comitia Tributa, instead of in the (patrician) Comitia Centuriata. The Comitia Tributa also received the right of deliberating and deciding upon all matters that were open to discussion and settlement in the Comitia Centuriata. The struggle continued, and the commons found it a great disadvantage that there was no written law to control the chief Patrician magistrates (the consuls) in their dealings with the Plebeians.

FIRST GREAT CODE OF ROMAN LAW

After violent opposition, and the increase of the number of tribunes to ten, the Plebeians carried a law (about 452 B. C.) that ten commissioners (Decemviri) should draw up a code to bind all classes of Romans alike. The ultimate result was the compilation (and engraving on thick sheets of brass) of the first and only code of law in the Roman republic—the *Laws of the Twelve Tables*. These laws made the Comitia Tributa into a really national legislature, embodying Patricians and Plebeians alike. The Plebeians, however, were still kept out of a share in the lands which they conquered in war, and a time of trouble came in the usurpation and violence of the Decemviri.

SECOND WITHDRAWAL OF PLEBEIANS TO MONS SACER

In 448 B. C. the Plebs, for the second time, seceded to the Mons Sacer, and the Decemviri were obliged to give way. Tribunes were re-appointed, and the new consuls were Valerius and Horatius. By them, in the Comitia Centuriata the great Valerian and Horatian Laws were passed, the first great charter of Roman freedom, and the power of the Plebeians was much increased. The Comitia Tributa was now on a level with the Comitia Centuriata, so that a Plebis-citum, or decree of the people's assembly, had henceforth the same force as one passed by the Comitia Centuriata, and became law for the whole nation. The struggle between the two orders, Patricians and Plebeians, continued. In 445 B. C. the Lex Canuleia, proposed by the tribune Canuleius, was passed, sanctioning intermarriage between Patricians and Plebeians.

MILITARY TRIBUNES WITH CONSULAR POWER

The Patricians, foreseeing that the time would come when the Plebeians must be admitted to the high offices of the state, divided the powers of the consulship, and, in 444 B. C., caused the appointment of Military Tribunes with consular power, officers who might be elected from either order, as commanders of the army, while the civil powers of the consuls were

kept by the Patricians in their own hands. In 443 B. C. the office of the Censors was established, with the proviso that they should be appointed only from the Patricians, and only by their assembly, the Comitia Curiata. In this the Patricians undoubtedly gained an accession of power.

FURTHER STRUGGLES BETWEEN PATRICIANS AND PLEBEIANS

The power of the Plebeians grew by degrees through the exertion of the prerogatives of the Tribunes, and about 400 B. C. the office of the Military Tribunes became open to the Plebeians, and four out of the six were chosen from that order. After the capture of Rome by the Gauls (390 B. C.), fresh troubles for the Plebeians arose. Their lands near Rome had been laid waste, cattle killed, and implements of agriculture destroyed. Heavy taxes were imposed to make up for the loss of public treasure carried off by the Gauls, and soon the old trouble of debt arose, and consequent oppression by the Patrician creditors.

EQUALITY AND FREEDOM ACHIEVED UNDER THE TRIBUNES LICINIUS AND SEXTIUS

The distress of the Commons increased until a great remedy was found by two patriotic tribunes of the Plebs, Caius Licinius Stolo and Lucius Sextius, the authors of the great Roman charter of equality and freedom. These able, determined men, after a tremendous struggle, fought with constitutional arms alone,—in which the Romans showed that respect for law and authority which, in their best days, so honorably distinguished them,—carried their point. The victory was won through the use of the power of the tribunes to stop the whole machinery of government. Year after year, for ten successive years, Licinius and Sextius were chosen tribunes, and, while the Patricians gained over the eight other tribunes, and prevented the popular bills being put to the vote in the Comitia Tributa, the two tribunes prevented the election of the Consular Tribunes (save in 371 B. C., for a war with the Latins), and other high officials, and would have no troops levied at all.

TERMS OF THE LICINIAN LAWS

At last, in 366 B. C., the famous Licinian Laws were carried, to-wit: (1) That the interest already paid by debtors should be deducted from the capital of the debt, and the remainder paid off in three equal annual instalments; (2) That no one should hold above five hundred jugera (about two hundred and eighty acres) of the public land, the surplus to be divided among the poorer Plebeians; (3) That the military tribunate with consular power should be abolished, and the consulship restored; but one Consul, at least, henceforward, should be a Plebeian. Sextius was himself elected, in 366 B. C., as the first Plebeian consul. All the other offices, dictatorship, censorship, prætorship, etc., were soon thrown open to the Commons,—so that at last, after the long struggle, perfect political equality was established.

FINAL ESTABLISHMENT OF DEMOCRACY

For a century and a half since the expulsion of the kings, Rome had been a republic, but an aristocratic republic; it was now truly a government of the people. From this time begins the golden age of Roman politics. Civil concord, to which a temple was dedicated, brought with it a period of civic virtue and heroic greatness.

THE CONQUEST OF ITALY

During this period, so harassed by internal contests, Rome was also engaged in frequent wars. These wars were with (1) their immediate relatives the Latins; with (2) their more distant relatives, the various other Italian nationalities; with (3) the Greek settlements in Southern Italy aided by Pyrrhus, king of Epirus; with (4) the Gauls in Northern Italy.

MEANING OF THESE WARS

These Roman wars meant a great deal to the future of this remarkable nation. Before Rome could play its grand part in the history of the world's civilization it was necessary, first of all, that it should become a great *Nation*. A great nation needs an extensive stage on which to play its part. Now the wars by which the Romans put down the various small and obstructive nationalities of Italy were the clearing of the stage, preliminary to the oncoming of that imperial figure, the "Mistress of the World."

WARS WITH THE SAMNITES IN SOUTHERN ITALY

The series of wars against Etruscans, Latins, Samnites, and Gauls, sometimes singly and sometimes in combination, is usually known in Roman history by the general designation of the "Latin wars" and the "Samnite wars." These wars filled the greater part of the half-century between 343 and 290 B. C.; and the Samnites were the leaders in this onset of the nations on Rome, the issue of which was to determine whether Rome or Samnium should govern Italy. The Romans were completely successful; and extricating themselves by their valor from this confused conflict of nations, the Romans found themselves masters of Central Italy (290 B. C.), —Samnites, Latins, etc., all their subjects.

WAR WITH THE GREEK KING PYRRHUS

The "Samnite wars" were succeeded by a short but brisk war, designated in Roman history "the war with Pyrrhus and the Greeks in Italy." Pyrrhus was an able and enterprising Greek prince whom the Greek towns of Southern Italy—fearful of being overwhelmed by what they called the "conquering barbarians of the Tiber"—had invited over from his native country to help them as champion of a Greek city.

Pyrrhus came over with a force of twenty-five thousand troops and twenty elephants. In the first battle (Pandosia, 280 B. C.) the Romans fought stoutly, until what they conceived to be gigantic gray oxen (the elephants) came thundering down upon them; so that the victory remained with Pyrrhus. In the next contest also (Asculum, 279 B. C.) Pyrrhus was successful; but the Romans made him pay so dearly for his triumph that he is said to have exclaimed, "Another such victory and I am undone!" Not having succeeded in his main object, Pyrrhus quitted Italy and went to Sicily; but soon after he returned, renewed the contest with the Romans, and was

utterly overthrown at Beneventum, in 275 B. C.

The subjugation of Southern Italy—of all that part called Great Greece—soon followed, and at the close of the year B. C. 266 Rome reigned supreme over the length and breadth of the peninsula of Italy, from the southern boundary of Cisalpine Gaul to the Sicilian Straits, and from the Tyrrhenian, or Tuscan, Sea to the Adriatic.

NATURE OF THE ROMAN STATE UNDER THE REPUBLIC.

The real governing power in Rome was the Roman people,—*populus Romanus*,—that is to say, the body of free inhabitants of the thirty-three tribes or parishes north and south of the Tiber, which constituted the Roman territory proper, together with a considerable number of persons in other parts of Italy who, either from being colonists of Roman descent or from having had Roman citizenship conferred on them, had the privilege of going to Rome and voting at the Comitia, or Assembly. The possessors of the suffrage thus formed a comparatively small body of men, such as might be assembled with ease in any public square or park, and these by their votes decided on the affairs of the commonwealth, controlling thus the destinies of the whole population of Italy, estimated at this time at above five million.

In addition to the *populus Romanus* there were two other classes,—the Italians and the Latins. The Italians, or *socii*, were the inhabitants of the allied and dependent Italian states that had submitted to Rome. These communities were almost all permitted to retain their own laws, judges, municipal arrangements, etc.; but they did not possess the Roman franchise, and hence had no share in the political affairs of the republic. The Latins were those who belonged to cities having the "Latin franchise," as it was called, from its having first been given to the cities of Latium when conquered. This did not give full Roman citizenship, but made it easier to obtain it.

SUMMARY OF ROMAN GOVERNMENT

Rome wisely left self-government to all the dependent and allied states, while she secured her sovereignty by three rights which she reserved to herself: (1) She alone made peace or declared war; (2) She alone might receive embassies; (3) She alone might coin money. Altogether it was an admirable system, vastly superior to the loosely related Grecian states. It was a system that made possible for the first time in the world's history a great, as well as a free, nation.

It is a striking fact that there was not yet even a dawning Roman literature; in art, science, philosophy, Rome had done—absolutely nothing. But, in fact, it was in the art of governing mankind that Roman genius was to appear; and it was this that showed itself in these early years,—it was their valor, their probity, their patriotism, their political tact, and not speculation or literary culture, that distinquished them.

CONSTRUCTION OF THE GREAT ROMAN ROADS

The famous Roman roads are to be found not only throughout Italy, where they were constructed in various directions from the capital, but in every land once conquered by Rome and stamped by her, as she stamped all her conquests, with ineffaceable marks of her possession and her power. These great roads were first made with the military purpose of providing a way that should be solid at all seasons of the year, for the march of legions and their heavy baggage through districts subdued by Roman arms. They were wonderful pieces of determined practical engineering, and in order to carry them straight to the points aimed at, marshes and hollows were filled up, or spanned with viaducts; mountains were tunneled, streams were bridged; no labor, time, or money was spared.

THE APPIAN WAY AND OTHER FAMOUS ROADS

The first and greatest of the Italian roads was the famous Appian Way (*Via Appia*, called *Regina Viarum*, "Queen of Roads"), which was begun by Appius Claudius, Censor in 312 B. C. The struggle with the Samnites was at its height when this great causeway, built with large, square stones on a raised platform, was made direct from the gates of Rome to Capua, in Campania. The *Via Appia* was afterwards extended, through Samnium and Apulia, to Brundusium (on the lower Adriatic), the port of embarkment for Greece. Parts of the original stonework are existing at this day. Other great roads of Italy were the *Via Aurelia*—the great coast-road northward, by Genua (Genoa), into Transalpine Gaul; the *Via Flaminia*, through Umbria to Ariminum; and the *Via Æmilia*, from Ariminum, through Cisalpine Gaul to Placentia.

III. EPOCH OF THE PUNIC WARS, 264-146 B. C.—The third period in Roman history extends from the final triumph of the Plebeians to the capture of Carthage, B. C. 146. Rome had hitherto been distracted with intestine feuds and dissensions, and had extended her dominion over but a small extent of territory. The admission of Plebeians to all the high offices of trust and distinction promoted the consolidation and strength of the republic, and the career of conquest was soon begun.

We now see Rome engage in the greatest conflict of her history,—that with the powerful maritime state, Carthage,—a struggle which, when it was fully developed, became for Rome a fight for national existence, in which her enemy was at the height of her power and resources, with Spain and Africa at her back, and with the first general of the age to command her armies.

RACES OPPOSED IN THE PUNIC WARS

The interest of the Punic wars (as they are called from the word *Punicus*, the Latin equivalent of Phœnician, and, in a limited sense, Carthaginian) is great and enduring. These wars were fought out to determine which of the two races, the Indo-Germanic, or Aryan, or the Semitic, should have the dominion of the

world. On the one side—the Aryan—was the genius for war, government, and legislation; on the other—the Semitic—the spirit of industry, navigation and commerce. The skill and valor, the determination and resource, displayed on both sides, have caused these wars of Rome and Carthage to remain most vividly impressed upon the memories of men.

CHARACTER OF THE CARTHAGINIAN STATE AND PEOPLE

Carthage had become, by the political and commercial energy of her citizens, the leading Phœnician state, ruling over Utica, Hippo, Leptis, and other cities of Phœnician origin in northern Africa. The Carthaginians paid also great attention to agriculture, and the whole of their territory was cultivated like a garden, supplying the population with abundance of food. This fact, taken with the wealth derived from her commerce, explains how it was that a city with no large extent of territory was enabled to hold out so long against the utmost efforts of Rome, and at one period to bring her, as it seemed, to the verge of ruin.

The political constitution of Carthage was that of an oligarchical republic, and her aristocracy is famed for the number of able men that came from its ranks. On the other hand, she was weakened by being dependent on mercenary troops in her wars, subject to revolts at home among the native populations whom she oppressed, and hampered by the factious spirit prevalent among her leading men.

She had a great commercial genius, but no gift for assimilating conquered peoples, or for establishing an empire on a solid and enduring basis, and therefore, in the end, she succumbed to Rome, whose aim it was to bring the nations under one wide, enduring sway. The struggle of Carthage against Rome became, in fact, the contest of a man of the greatest abilities—Hannibal—against a nation of the utmost energy and determination, and the nation, in the long run, won the day.

FIRST PUNIC WAR, 264-241 B. C.

The Carthaginians held Corsica, Sardinia, and various colonies in Spain and possessions in Sicily. It was in Sicily that the cause of quarrel between Rome and Carthage was found, and Rome picked the quarrel by interference in a local matter at Messana. Hiero, king of Syracuse, as we have seen, had come over to the Romans, who, after defeating the Carthaginian army and taking Agrigentum (262 B. C.), determined to make themselves masters of Sicily. For this a fleet was needed, and with Roman energy they soon built one. Twice their squadrons were destroyed, but in 260 B. C. the consul Duilius gained a great naval victory at Mylæ, on the northeast coast of Sicily, and, from this time, Rome became more and more nearly a match for Carthage on her element, the sea. The Romans invaded Africa without success (255 B. C.), but were generally victorious in Sicily.

In 247 B. C. the great Hamilcar Barca (father of Hannibal and Hasdrubal) was appointed to the Carthaginian command in Sicily, and maintained himself there with great patience and skill against all the Roman efforts. But, in 241 B. C., the Roman commander Lutatius Catulus utterly defeated the Carthaginian fleet off the Ægates Islands, on the west coast of Sicily, and the Carthaginians then gave in. All Sicily, except the territory of Rome's faithful alley, Hiero of Syracuse, thus became (241 B. C.) the first Roman province.

CONQUEST OF SARDINIA, CORSICA, AND CISALPINE GAUL

The Romans, with gross ill-faith and injustice, took advantage of a revolt against Carthage by her mercenary troops to deprive her of Sardinia and Corsica (238 B. C.), and Sardinia was made into a province. Their next exploit was the conquest of Cisalpine Gaul, which was completed 222 B. C., and the Roman hold upon the new territory was confirmed by the establishment of military colonies at Placentia and Cremona.

THE CARTHAGINIANS UNDER HAMILCAR IN SPAIN

Carthage had resolved upon revenge for past defeats and injuries from Rome, and intrusted her cause to the great Hamilcar Barca. He sought to create for his country a new empire in Spain, which might be used as a base of operations against the foe for whom he had a deadly hate. From 237 to 229 B. C. (when he fell in battle) he was engaged in reducing a large part of Spain to submission.

In 221 B. C. his son, the illustrious Hannibal, took the Spanish command, and he soon brought on a new conflict with Rome by his capture of her ally, the city of Saguntum, on the northeast coast of Spain.

HANNIBAL AND THE SECOND PUNIC WAR, 218-202 B. C.

The hero of the Second Punic War is Hannibal, one of the purest and noblest characters in history. In 218 B. C. the Carthaginian general crossed the Alps, after a five months' march from Spain, and descended with a storm of war upon the Romans. With a force of twenty thousand foot and six thousand horse he encountered the consular armies, and defeated them at the rivers Ticinus and Trebia (218 B. C.), in Cisalpine Gaul, the Trasimene Lake in Etruria (217 B. C.), and most decisively, and with immense slaughter, at Cannæ, in Apulia, in 216 B. C. For fifteen years (218 to 202 B. C.) Hannibal maintained his ground in Italy, defeating the Romans again and again, opposed by the cautious Fabius Maximus and the daring Marcellus (the conqueror of Syracuse), but unable to capture Rome, or to subdue Roman steadfastness and courage.

CAUSES OF HANNIBAL'S DEFEAT

The chief causes of the ultimate failure of Hannibal, besides the doggedness of Rome's resistance, were the faithfulness of many of Rome's allies, especially the Latins, in Italy, the success of Roman armies, under Publius Scipio, in Spain (temporarily subdued 205 B. C.), and the want of due support by Carthage to her great leader. The crisis came in 207 B. C., when Hannibal's brother, Hasdrubal, crossed the Alps into Italy with a powerful army which, joined with Hannibal's in Southern Italy, would probably have effected the conquest of Rome, now

almost exhausted. This was not to be. Hasdrubal was defeated, and slain by the Romans at the decisive battle of the Metaurus (a river in Umbria), one of the great critical contests of history. The junction of the forces thus prevented, Rome was saved, and, in order to be rid of Hannibal, the war was carried now into the enemy's country.

DEFEAT OF HANNIBAL BY SCIPIO AFRICANUS AT ZAMA

Publius Scipio, so successful in Spain, crossed from Sicily to Africa in 204 B. C., and did so well for Rome that Hannibal was recalled. The Second Punic War ended with the defeat of Hannibal by Scipio at Zama (five days' journey from Carthage), in 202 B. C. The conqueror gained the surname of Africanus. Hannibal lost his army, but not his fame. Rome was certain now to rule the world. The terms of peace with Carthage made her for the time a mere dependency of Rome. All her foreign possessions were given up; her fleet was reduced to ten ships; she was to make no war without Rome's permission; and an enormous war indemnity was exacted.

SUBJUGATION OF MACEDON BY ROME

In 213 B. C. Rome attacked Philip V., king of Macedon, because he had made a treaty with Carthage, and, after making an alliance with the Ætolians, the Romans gained some successes over Philip in the First Macedonian War, ending in 205. The Second Macedonian War (200-197 B. C.) put an end to Macedon's supremacy in Greece, by the victory of the ex-consul Flamininus at Cynoscephalæ, in Thessaly, 197 B. C.

ROMAN ARMS ARE CARRIED INTO ASIA

Antiochus the Great, of Syria, who had irritated Rome by meddling in the affairs of Greece, which he invaded in 192 B. C., was beaten by the Roman armies in Greece and Asia Minor, and in 188 B. C. made peace on terms that left Roman influence supreme in Asia Minor as far as Syria.

THE FINAL FATE OF HANNIBAL

The great Carthaginian, even after Zama, had not despaired of himself or of his country. He set vigorously to work at internal reforms in Carthage with a view to renewing the contest with Rome; but, being thwarted by jealous and unpatriotic rivals, who also intrigued for his surrender to the Romans, he fled to the court of Antiochus the Great, of Syria, in 194 B. C. In rejecting her greatest man, Carthage had lost her last chance of regaining any real power. Hannibal was driven from his shelter with Antiochus by the Roman demand for his surrender, and took refuge with Prusias, king of Bithynia, for some years; but Roman dread of his abilities pursued him, and hopeless of escape, he poisoned himself about 183 B. C., leaving Rome free at last to pursue her victorious career.

ROMAN CONQUEST OF THE GREEK STATES

A Third Macedonian War, begun in 171 B. C., was waged by the Romans against King Perseus, son of Philip V., and ended with a great Roman victory at Pydna, in 168 B. C., and the extinction of Macedon as a kingdom. After a revolt, called the Fourth Macedonian War, and a war against the forces of the Achæan League, Corinth was taken by Mummius, and Macedonia and Greece became Roman provinces (147 and 146 B. C.)

THIRD PUNIC WAR AND DESTRUCTION OF CARTHAGE

There was a powerful party in Rome (headed by the stern censor Porcius Cato) who relentlessly insisted on the destruction of Carthage. Her warlike neighbor, Masinissa, king of Numidia, was encouraged by the Romans in harassing attacks, and in 149 B. C. Rome found a pretext for war. Her forces could not be resisted, and Carthage offered a complete submission, seeking the preservation of her commerce and her capital by a surrender of arms, war-ships, and her internal independence.

When Rome insisted on the destruction of the city of Carthage itself, and the removal of the inhabitants to inland abodes, the Carthaginians took counsel of despair, and resolved to stand a siege within their strong fortifications. Scipio Africanus Minor conducted the three years' siege of the great commercial city and her citadel, and Roman determination, as usual, carried its point. After fearful house-to-house fighting the remnant of seven hundred thousand people surrendered; the place was set on fire, and burned for seventeen days; the ruins were leveled with the ground, and Carthage the proud city, alike with Carthage the commercial state, ceased to exist, in 146 B. C., the year of the final conquest of Greece. Part of the territory was given to Masinissa of Numidia, Rome's ally; part became the Roman province of Africa.

GRANDEUR OF ROME AFTER HER FOREIGN CONQUESTS

At the beginning of the period of conquest (266-133 B. C.), the Roman dominion was confined to the peninsula of Italy; at its close it extended over the whole of southern Europe from the shores of the Atlantic to the straits of Constantinople, over the chief Mediterranean islands, and over a portion of North Africa, while farther east, in Egypt, Asia Minor, and Syria, its influence was paramount. At the beginning Rome was merely one of the "Great Powers" of the world as it then was,—that is, she ranked with Carthage, Macedonia, and the kingdom of the Seleucidæ; at its close she was clearly the sole Great Power left.

THE ORIGIN OF PROVINCIAL GOVERNMENT

The addition of the conquered countries resulted in a new feature of Roman rule called Provincial government. Retaining their native habits, religion, laws, etc., the inhabitants of every province were governed by a military president, sent from Rome, with a staff of officials. The provincials were required to pay taxes in money and kind; and these taxes were farmed out by the censors to Roman citizens, who, under the name of Publicans, settled in the various districts of the provinces. Thus, like a network proceeding from a center, the political system of the Romans pervaded the mass of

The Colisseum (*kol-e-see'-um*), in the background, was dedicated by Titus, A. D 80, in a grand festival of 100 days, at which 5,000 beasts were slaughtered in the games. The successive tiers of seats, receding from the arena to the summit, gave room for 90,000 spectators. Gladiatorial contests continued until abolished by Honorius, A. D. 405.

millions of human beings inhabiting the shores of the Mediterranean; and a vast population of various races and languages were all bound together by the cohesive power of Roman rule.

ROME AT THE HEIGHT OF ITS GRANDEUR

The luster of the Roman power and glory of the Roman name were now at their height. The eyes of all the world were now on Italy, the young republic of the West. Into Rome all talents, all riches, flowed. What a grand thing in those days to be a Roman citizen; so that, wherever one walked,—in Spain, in Africa, even in once proud Athens, he was followed, feasted, flattered! What a career was opened to those who wished for wealth or aspired to fame! But in the very sunburst of Rome's glory, the germs of decay were ripening.

On the Romans themselves the effect of their foreign conquests were both good and bad; but perhaps the evil outweighed the good.

ERA OF GREAT PUBLIC WORKS

The wealth poured into Rome by the conquest of Carthage, of Greece, and the East, and the considerable revenue derived from the permanent taxation of the provinces, enabled the Romans to carry out a great system of public works. Throughout Italy splendid military roads which remain to this day were built, the provinces were traversed by imperial highways, and fine stone bridges were thrown across the Tiber. In Rome splendid public buildings were erected, the city was sewered, the streets were paved (174 B. C.), two new aqueducts (the Marcian, built in 144 B. C., at a cost of ten million dollars) were constructed; and it may be noted that the Consul P. Scipio Nasica, in 159 B. C., set up in Rome a public clepsydra, or water clock, the citizens having for six centuries gone on without any accurate means of knowing the time by night as well as day.

INFLUENCE OF GREEK CULTURE ON ROME

The effect on Rome of the conquest of Greece and the Hellenized East was very marked. Greek rhetoricians, scholars, tragedians, musicians and philosophers in large numbers took up their abode in Rome. The city swarmed with Greek schoolmasters. Greek tutors and philosophers, who, even if they were not slaves, were as a rule accounted as servants, were now permanent inmates in the palaces of Rome; people speculated in them, and there is a statement that the sum of two hundred thousand sesterces (ten thousand dollars) was paid for a Greek literary slave of the first class.

RISE OF NATIVE ROMAN LITERATURE

The stimulus of Greek literary culture led to native production, and in the second century, B. C., we have the beginning of that Latin literature which we still read. Though the great period of Roman letters did not come till a century after this time (age of Augustus), yet there arose a number of writers of no ordinary power. Among these should be mentioned Ennius, the father of Roman poetry; Plautus, his contemporary, a man of rich poetic genius; the elder Cato, the first prose writer of note; and Terence, the most famous of the comic poets.

While the Romans were in some respects benefited by contact with the superior though decaying culture of Greece, they also learned a great deal that was debasing. They became effeminate, luxurious, and corrupt in morals; marriage was not respected; the old Roman faith waned, and it was said that two augurs could not meet in the street without laughing in each other's face.

GROWTH OF POLITICAL AND SOCIAL CORRUPTION

The political system of Rome now began to lead to a dreadful state of public corruption. The Roman government was devised for the rule of a city: all power was in the hands of the civic voters, and when there came to be great prizes, in the way of great offices at home and abroad, the voters began to find that their votes were worth something, and unblushing bribery and corruption became common.

The demands of the large planters and merchants led to a great extension of the slave-trade. All lands and all nations were laid under contribution for slaves, but the places where they were chiefly captured were Syria and the interior of Asia Minor. It is probable that at the period at which we have now arrived (middle of the second century B. C.) there were twelve million slaves against five million free inhabitants in the Italian peninsula,—a most lamentable state of things!

In addition to the slaves, Italy became filled up with a motley parasitic population from Asia and Africa and all the conquered lands,—and the result of this intermixture soon appeared in a marked degeneracy in the Roman race itself.

THE NEW ROMAN CONTRASTED WITH THE OLD

The decay of old Roman virtue became at the same time apparent in the great increase of luxury. This displayed itself in houses, villas, pleasure gardens, fish ponds, dress, food and drink. Extravagant prices—as much as one hundred thousand sesterces (five thousand dollars)—were paid for an exquisite cook. Costly foreign delicacies and wines were affected, and the Romans in their banquets vied with one another in displaying their hosts of slaves ministering to luxury, their bands of musicians, their dancing girls, their purple hangings, their carpets glittering with gold or pictorially embroidered, and their rich silver plate.

In the midst of the system there were not wanting some noble patterns of the old Roman type, among whom should be named Cato, who kept up a constant protest all his life against the growing luxury of his countrymen, and died declaring that they were a degenerate race. Such men were, however, rare exceptions; and we shall hereafter see that the evil system already operative in the second century went on increasing, till finally, a century afterwards, it resulted in the total subversion of the republic.

The picture just given of the state of Roman society in the last half of the second century B. C. prepares us for the period of civil strife on which we now enter.

IV. EPOCH OF THE CIVIL WARS, 146-31 B. C.—The fourth period extends from the capture of Carthage and Corinth to the establishment of the Imperial Government by the battle of Actium, B. C. 31. During this whole time the Roman history is a continued tale of domestic disturbances. From the fall of Carthage to the battle of Actium, it presents but a melancholy picture, a blood-stained record of sedition, conspiracy, and civil war.

A number of causes had resulted in the growth of an aristocracy founded purely on wealth; the old division of society into patricians and plebeians had ceased, and there arose a still worse division into classes,—the rich and the poor.

THE GRACCHI ESPOUSE THE CAUSE OF THE POOR

The cause of the poor against the rich was taken up by a noble young tribune of the people named Tiberius Gracchus. Tiberius and his afterwards distinguished younger brother Caius (the two being known in history as the Gracchi) were sons of a noble Roman matron, Cornelia, daughter of the great Scipio Africanus.

Tiberius Gracchus proposed a land-law (agrarian law), which would limit the amount of public land that could be held by any one individual and provided for the distribution of the rest in small homesteads. The aristocracy immediately raised a storm, and induced another tribune to veto the measure. Now, according to the Roman code, no proposal could become law unless all the tribunes were unanimous. Gracchus then secured a popular vote expelling his colleague from the tribuneship, and the land-law was passed by the people, 133 B. C. In the meantime, however, Gracchus's year of office expired, and he came up for re-election. The nobles resolved to prevent this by violence.

MURDER OF THE TRIBUNE, TIBERIUS GRACCHUS

Gracchus, learning this, bade his friends arm themselves with staves; and when the people began to inquire the cause of this, he put his hand to his head, intimating that his life was in danger. Some of his enemies ran to the senate and reported that Tiberius openly demanded a crown. A body of the aristocrats with their clients and dependents then rushed among the unarmed crowd, and murdered Gracchus with three hundred of his adherents,—133 B. C.

Tiberius Gracchus was dead, but his work remained; that is to say, the measure which he had proposed was law, and the commissioners intrusted with the task of allotting the lands prosecuted their labors for two or three years. The nobles, however, obstructed the work as much as possible, so that between them and the champions of the people there was a continuous struggle.

THE STRUGGLES AND DEATH OF THE YOUNGER GRACCHUS

This struggle became still more fierce when Caius Gracchus, ten years after the death of his brother, claimed and obtained the tribuneship, and then took up that brother's work. The agitation for the agrarian law was renewed, an enactment was made for a monthly distribution of corn to the city poor, and various other reforms were proposed by him. After holding the tribuneship for two years, however, he lost the office through the intrigues of his opponents. The nobles were determined to crush Gracchus; accordingly, at one of the public assemblies they attacked the partisans of the popular leader, and there ensued a bloody combat (121 B. C.) in which three thousand of his adherents were slain. Gracchus himself fled into a wood across the Tiber; but, being pursued, he chose to die by the hands of a faithful slave rather than fall into the power of his enemies.

RISE OF MARIUS AND SULLA

The ill-will between the nobles and the people continued just as bitter after the death of Gracchus; and matters finally shaped themselves in such a way that the nobles, or senatorial party, came to be represented by a leader named Sulla, and the democracy, or Commons, by another, called Marius. These men came to prominence in the course of two or three wars in which Rome was engaged for twenty-five or thirty years after the time of which we have been speaking; and finally they acquired such power as to bring on a civil strife that deluged Italy with blood.

The wars just referred to were: the Jugurthine war (111-106 B. C.), the war against the Cimbri (113-101 B. C.), and the Social war (90-89 B. C.), with the details of which we need not concern ourselves; but the fourth contest was of more moment, and needs notice here. This was the Mithridatic war.

BOLD DESIGN OF MITHRIDATES AGAINST ROME

Mithridates, king of Pontus, a bold and able soldier, formed the design of uniting the Asiatic states and Greece in a vast confederacy against the Roman dominion. He began by causing about eighty thousand Romans who dwelt in the cities of Asia Minor to be massacred in one day (88 B. C.). He then invaded Greece.

The command in this important war was eagerly sought by both Marius and Sulla. Sulla prevailed; he was elected consul and put in command. Marius, being chagrined at this, succeeded in having the popular party set aside Sulla. But the aristocratic general marched to Rome and compelled Marius to flee into Africa. Sulla then set out for Greece, all of which submitted to him, the army of Mithridates being defeated (86-84 B. C.)

HORRIBLE MASSACRES ATTEND THE STRUGGLE BETWEEN MARIUS AND SULLA

During the absence of Sulla, Marius returned to Italy. Entering Rome in 86 B. C., he filled the entire city with slaughter, and in particular he caused the murder of the leading senators that had supported his rival. Marius then caused himself to be proclaimed consul without going through an election; but a fortnight later he died.

Notwithstanding the death of Marius, the Marian party still continued in power. Sulla, hearing of their successes, hastily concluded a peace with Mithridates, and hurried to Italy (83 B. C.). After a severe struggle, Sulla utterly overthrew the Marians. The blood of

massacre then flowed a second time,—in a yet greater stream. Lists of proscribed persons, embracing all who belonged to the people's party, were published every day, and the porch of Sulla's house was full of heads.

Having put down all his enemies, Sulla caused himself to be proclaimed dictator for an unlimited time (81 B. C.). He then proceeded to re-organize the government wholly in the interest of the aristocratic party; but to the great surprise of every one he three years afterward resigned his power and retired to private life. Sulla died in 78 B. C.; he was honored with a magnificent funeral, and a monument with the following epitaph written by himself:

"I am Sulla the Fortunate, who in the course of my life have surpassed both friends and enemies; the former by the good, the latter by the evil, I have done them."

RISE OF POMPEY THE GREAT

After the death of Sulla, the most prominent figure among all the men of the aristocratic party was Cneius Pompey, who had distinguished himself as a lieutenant of Sulla, and afterwards won renown by his management of several important matters in which Rome was engaged —especially in the suppression of a formidable revolution in Spain under a very able leader named Sertorius (77-72 B. C.), and in stamping out a fire of revolt kindled by Spartacus, the leader of a band of gladiators, who, joined by a large force of discontented spirits, kept Italy in alarm for two or three years (73-71 B. C.). These exploits made Pompey a popular favorite, and in the year 70 B. C. he was rewarded by being made consul along with a rich senator named Crassus.

HIS MILITARY EXPLOITS IN THE EAST

At the expiration of his year of office he retired to private life, but was soon called upon to supress a formidable combination of pirates who infested the Mediterranean Sea and had their headquarters in Cilicia (in Asia Minor). This task he accomplished in three months. These triumphs, aided by his political influence, enabled Pompey to procure the command in the war against Mithridates, who had renewed his scheme of conquering the Eastern Roman provinces. He was given powers such as never had been delegated to any Roman general. This war lasted for two years (66-64 B. C.), and was marked by a series of brilliant triumphs for Pompey. He utterly crushed Mithridates (who died by self-administered poison), as well as his son-in-law Tigranes, subdued Phœnicia, made Syria a Roman province, and took Jerusalem. Thus with the glory of having subjugated and settled the East he returned to Rome (62 B. C.), where a magnificent triumph awaited him.

FAMOUS STRUGGLES OF THE FOUR FACTIONS

Meanwhile there seem to have grown up, after the death of Sulla, four factions in Rome: the "oligarchical faction," consisting of the small number of families the chiefs of which directed the senate, and in fact governed the republic; the "aristocratic faction," comprising the mass of the senators anxious to obtain the power usurped by a few of their colleagues; the "Marian party," including all those whose families had been prosecuted by Sulla, and who now began to rally, and aspire to power; the "military faction," embracing a crowd of old officers of Sulla, who, having squandered the fortunes they had gained under him, were eager for some revolution that might give them the opportunity to improve their condition.

THE GREAT LEADERS OF THE FACTIONS—POMPEY, CICERO, CRASSUS, CAESAR AND CATILINE

At the head of the oligarchical faction was Pompey; but during his absence in Asia its representative was Marcus Tullius Cicero (born 106 B. C.), who had established his reputation as the first orator in Rome. He had risen through various offices to the prætorship, and at the time Pompey left for the East aspired to be consul. He did not himself belong to a noble family, but still he made himself the champion of the oligarchy. Though vain and boastful, he was a virtuous and patriotic man.

The leader of the aristocratic faction was Crassus, formerly the colleague of Pompey in the consulship, now his personal rival. He was a man of no great ability, but his position and his immense wealth made him influential. (After prodigious expenditures, he died worth ten million dollars.)

The leader of the third, or Marian party, was a man six years younger than Pompey or Cicero, who, distinguished in youth for his accomplishments and his extravagance, rose in the year 65 B. C. to the office of edile. This was Caius Julius Cæsar,—a man of pre-eminent ability, one of the greatest that ever lived. He was the nephew of Marius, and now stood forward as the leader of the Marian party. He was of an old patrician family, and took up the cause of the people to serve his own ends.

CONSPIRACY OF CATILINE

The leader of the military faction was Catiline, who had been one of the ablest and most ferocious of Sulla's officers. He had a large following of debauched young patricians and ruined military men, who thought they would better their fortunes by making Catiline consul. Cicero was his rival, and, receiving the support of the senators, was elected. Enraged at his defeat, Catiline formed a conspiracy of which the murder of Cicero and the burning of Rome were parts. A woman betrayed the plot to Cicero, who denounced Catiline with such fiery eloquence that he had to flee from Rome. With a band of confederates he attempted to reach Gaul; but he was overtaken in Etruria and slain, 62 B. C.

THE FIRST TRIUMVIRATE: CAESAR, POMPEY AND CRASSUS

Cæsar and Pompey, now finding that they agreed in many of their views, resolved to unite their forces. To cement their union more closely, Cæsar gave his only daughter, Julia, in marriage to Pompey. For various reasons it was found desirable to admit Crassus to their political partnership, and thus was formed (60 B. C.) that famous coalition known in Roman history as the "First Triumvirate."

The object of Cæsar and Pompey was to thwart the senatorial party in every way, and wield all the power themselves.

The formation of the triumvirate was followed by the election of Cæsar to the consulship (59 B. C.); and when his year of office expired he obtained for himself the government of Gaul for five years, and then for another five. This was probably the great object of Cæsar's desires. No doubt he was already brooding over the design of making himself master of Rome; and for this purpose he would need an army.

During the years 58-50 B. C. Cæsar made eight campaigns in Gaul, forming the remarkable series of operations which he afterwards described with such pointed style in his *Commentaries*.

The result of his eight years' campaigning was that, in the spring of 50 B. C., Cæsar was able to take up his residence in Cisalpine Gaul, leaving the three hundred tribes beyond the Alps, which he had conquered by such bloody means, not only pacified, but even attached to himself personally. His army, which included many Gauls and Germans, was so devoted to him that it would have marched to the end of the world in his service.

DOWNFALL OF CRASSUS AND RIVALRY OF CAESAR AND POMPEY

During Cæsar's campaigns in Gaul (where his government was prolonged for a second five-year term), Crassus disappeared from the triumvirate. After holding the consulship with Pompey, in 55 B. C., he went as proconsul to the province of Syria, in 54 B. C. His greed of wealth, and desire for the military fame which he envied in Cæsar and Pompey, brought him to ruin, by inducing him to attack the kingdom of Parthia,* where he was soon afterward murdered. So that the triumvirate became a duumvirate, or league of two men,—Cæsar and Pompey.

Now between these two men there had for some time been a growing coldness. It was said that Cæsar was a man who could brook no equal, and Pompey a man who could suffer no superior. A feeling of rivalry having once arisen, naturally grew till Cæsar and Pompey became the bitterest enemies. Pompey went over to the aristocratic party to which he had originally belonged, and having been made sole consul for the year 52 B. C., he began to exert his great influence against Cæsar. In this he was supported by the nobles, who dreaded Cæsar's immense power.

FINAL STRUGGLE BETWEEN CAESAR AND POMPEY

As the period of Cæsar's command would expire in the year 49 B. C., he had determined to obtain the consulship for the year 48 B. C., since otherwise he would become a private citizen. Accordingly he demanded, though absent, to be permitted to put himself in the lists for the consulate. But it was proposed, through the influence of Pompey, that Cæsar should lay down his command by the thirteenth of November, 50 B. C. This was an unreasonable demand; for his term of government over Gaul had another year to run, and if he had gone to Rome as a private citizen to sue for the consulship, there can be no doubt that his life would have been sacrificed. Cæsar, still anxious to keep the peace, offered, at the beginning of the year 49 B. C., to lay down his command if Pompey would do the same; but this the senate refused to accede to, and a motion was passed that Cæsar should disband his army by a certain day, and that if he did not do so, he should be regarded as an enemy of the state.

THE CROSSING OF THE RUBICON

Cæsar promptly took his resolve: he would appeal to the arbitrament of arms. He had the enthusiastic devotion of his soldiers, the great mass of whom, being provincials or foreigners, cared very little for the country whose name they bore. Accordingly, in January, 49 B. C., he advanced from his headquarters at Ravenna to the little stream, the Rubicon, which separated his own province and command from Italy. The crossing of this river was in reality a declaration of war against the republic; and it is related that, upon arriving at the Rubicon, Cæsar long hesitated whether he should take this irrevocable step. After pondering many hours he at length exclaimed, "The die is cast!" and plunged into the river.

Pompey concluded not to attempt to defend Italy, but to retire upon the East, where he would gather a great army and then return to overwhelm the "usurper." Accordingly he retreated to Greece.

CAESAR MASTER OF ITALY AND DICTATOR OF ROME

In sixty days Cæsar made himself master of all Italy. Then marching to Rome he had himself appointed dictator and consul for the year 48 B. C. He showed masterly statesmanship, and soon brought the general current of opinion completely over to his side.

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*Parthia had the rare distinction of being a country the prowess of whose warriors baffled the efforts of Rome for her subjection. The Parthian kingdom, southeast of the Caspian Sea, came into existence about 250 B. C., by revolt from the Seleucids, the monarchs of Syria, and became a powerful realm after the death of Alexander the Great. It included Parthia proper, Hyrcania, and afterwards (130 B. C.) Bactria, so that at last its dominions stretched from the Euphrates to the Indus, and from the river Oxus to the Indian Ocean. The Parthians adopted the Greek religion, manners, and customs, which had been introduced into that part of Asia by Alexander's conquests.

The renowned cavalry of Parthia seem to have been all-powerful only on their own soil, for their invasions of the Roman province of Syria in 39 and 38 B. C. were utterly defeated, while the invasion of Parthia by the great Roman general and triumvir, Mark Antony, in 36, was repulsed with loss of a great part of his army. In 20 B. C. the Parthian king Phraates restored, chiefly as a friendly concession, the standards and prisoners taken from Crassus and Antonius, and this is the event commemorated by the Roman poets of the day as equivalent to a submission by Parthia. Under the Roman emperors the Parthians sometimes courted and were sometimes at war with Rome, and were partially conquered for a time under Trajan. The Parthian kings encouraged Christianity. In A.D. 226 a revolt of the Persians put an end to the Parthian kingdom, revived the religion of Zoroaster, stopped the eastward progress of Christianity in Asia, and began modern history in Persia.

BATTLE OF PHARSALIA AND DEATH OF POMPEY

Meantime, Pompey had gathered a powerful army in Thessaly, and thither Cæsar with his legions proceeded against him. The decisive battle between the two mighty rivals was fought at Pharsalia, in 48 B. C. It resulted in the utter defeat of Pompey; and as it left Cæsar the foremost man in the Roman world, it must be regarded as one of the great decisive battles of history.

Pompey, after his defeat, sought refuge in Egypt; but he was assassinated by the orders of Ptolemy, when seeking to land on the coast of that country. Cæsar, who followed in pursuit, did not hear of his death until his arrival in Alexandria, where messengers from Ptolemy brought him Pompey's head. Cæsar, who was both a generous man and a compassionate foe, turned with horror from the spectacle, and with tears in his eyes gave orders that the head should be consumed with the costliest spices.

CAESAR, CLEOPATRA AND THE CONQUEST OF THE EAST

At Alexander Cæsar became enamored of Cleopatra, the young, beautiful, and fascinating queen of Egypt. He even mixed himself up with a quarrel that was going on between her and her younger brother Ptolemy, to whom, according to the custom of the country, she was married, and with whom she shared the throne. This intermeddling led Cæsar, who had but a small force with him, into conflict with the troops of the king. A fierce battle was fought in the city. Cæsar succeeded in firing the Egyptian fleet; but unfortunately the flames extended to the celebrated Library of the city of Alexandria, and the greater part of the magnificent collection of manuscripts was burnt. Cæsar was finally successful: Ptolemy was killed, and Cleopatra was made queen of Egypt. From Alexandria Cæsar marched into Pontus to attack Pharnaces, son of Mithridates, whom he subdued so quickly that he described the campaign in the most laconic dispatch ever penned: *Veni, vidi, vici*,—"I came, I saw, I conquered."

CAESAR'S FINAL VICTORY AND TRIUMPHANT RETURN TO ROME

Pompey's forces that escaped from Pharsalia had established themselves in the Roman province of Africa. They were commanded by Scipio and Cato. Cæsar having settled matters in the East, now proceeded against this force, which he utterly destroyed at Thapsus, early in the year 46 B. C. Scipio and Cato killed themselves. One more rally the Pompeians made in Spain, but they were defeated by Cæsar in the decisive battle of Munda (March, 45 B. C.).

Cæsar returned to Rome after the battle of Thapsus, the master of the Roman dominion. The republic went out when Cato fell upon his sword at Utica; the monarchy came in with the triumphal entry of Cæsar into Rome in the summer of 46 B. C. It is true Cæsar was not king (*rex*) in name, but he was so in substance. His position as chief of the state was this: he was invested with the dictatorship for ten years,—an arrangement changed soon afterwards to perpetual dictator,—and was hailed with the title of Imperator for life. The latter title, Imperator (meaning commander), was one which belonged under the republic to the victorious general; but it was a temporary title, always laid aside with the surrender of military command. Cæsar was allowed to use it in a special way and permanently, and in his case it had much the meaning of the term Emperor,—a word which is simply Imperator cut short.

FEELINGS OF THE ROMANS TOWARD CAESAR

There can be no doubt that the Romans were well satisfied to be under the rule of Cæsar. The republic was a mere name, for liberty had expired when the Gracchi were murdered, and subsequent dissensions were merely contests for power between different factions. Hence the Roman people, weary of revolution, were quite content to find peace under the just though absolute rule of one master.

It is important to recognize this as the real state of public feeling, because we shall now have to see that Cæsar fell a victim to assassination, and it might be thought that his overthrow was the people's revolt from monarchical rule. But it was the act of a small knot of conspirators who, with the cry of "Liberty and the Republic" in their mouths, did away with the Imperator to serve their own ends.

THE CONSPIRACY AGAINST CAESAR AND HIS ASSASSINATION

The chiefs of the conspiracy were Caius Cassius and Marcus Junius Brutus. Both had received great favors from Cæsar; but they thought they had not been honored enough, and they were intensely jealous of the dictator's greatness. These were joined by other malcontents, and the plotters swelled their ranks by representing that Cæsar designed to assume the diadem and the title of king; so that the conspiracy finally included about sixty senators.

It is not certainly known whether or not Cæsar thought of taking the name of king. It is known, however, that the consul, Mark Antony, entered in the public acts, "that by the command of the people, he, as consul, had offered the name of king to Cæsar, perpetual dictator; and that Cæsar would not accept of it."

The plot ripened into a determination to assassinate Cæsar, and the conspirators fixed on the Ides (i. e. 15th) of March as the time of putting the design into execution. Rumors of the plot got abroad, and Cæsar was strongly urged not to attend the senate. But he disregarded the warnings which were given him. As soon as Cæsar had taken his place, he was surrounded by the senatorial conspirators, one of whom, pretending to urge some request, seized his toga with both hands and pulled it violently over his arms. Then Casca, who was behind, drew a weapon and grazed his shoulder with an ill-directed stroke. Cæsar disengaged one hand and snatched at the hilt, exclaiming, "Cursed Casca, what means this?" "Help!" cried Casca, and at the same moment the conspirators aimed each his dagger at the victim. Cæsar for an instant defended himself; but when he perceived the steel flashing in the hand of Brutus (Marcus Junius), he exclaimed

"What! thou too, Brutus!" (*Et tu Brute!*) and drawing his robe over his face he made no further resistance. The assassins stabbed him through and through; and, pierced with twenty-three wounds, Cæsar fell dead at the foot of the statue of his great rival, Pompey.

Julius Cæsar was in his fifty-sixth year, when, on the fifteenth of March, B. C. 44, he was stricken down.

EFFECT OF CAESAR'S DEATH AND THE ORATION OF ANTONY

It is said that "revolutions never go backwards." Brutus and his fellow-conspirators struck down Cæsar in the name of liberty; but the blow that leveled the master of Rome did not bring back the republic,—it only insured the appearance of new claimants for supreme power, and consequently new civil wars.

On the occasion of Cæsar's funeral the consul, Mark Antony, delivered an oration over the dictator's body, and to such a height did the feeling of the Romans against the plotters rise, that Brutus and Cassius were obliged to escape forthwith from the city to avoid destruction.

The condition of affairs left Mark Antony in some respect the representative of Cæsarean principles; but a more direct claimant to the succession appeared in Cæsar's great-nephew, Caius Octavius, then a youth nineteen years old. The dictator had adopted Octavius as his son; so his name became Caius Julius Cæsar Octavianus. Octavius had all the old soldiers on his side, and raised the standard of Cæsar's vengeance.

TRIUMVIRATE OF ANTONY, OCTAVIUS AND SEPIDUS

At first Antony and Octavius were at strife; but finally they became reconciled, and associating with them Lepidus, the "master of the horse," the three formed the Second Triumvirate (43 B. C.), and concerted a plan to divide among themselves the supreme authority. In order to do this it was necessary utterly to crush both their personal enemies and the forces of the republic.

To accomplish the first object, they began a system of proscription more ruthless and bloody than that of Marius and Sulla. It is recorded that three hundred senators, two thousand knights, and many thousands of citizens were sacrificed. The most illustrious of the victims was the famous orator Cicero, whose severe invectives against Antony had procured him the relentless hatred of the triumvir. The aged patriot, while escaping from Rome in a litter, was assassinated.

BATTLE OF PHILIPPI AND DIVISION OF THE ROMAN WORLD

The second object was the destruction of the republican forces. Now Brutus and Cassius, finding their position in Italy to be desperate, had retired to the East, where in Thrace they gathered an army of about one hundred thousand men. Antony and Octavius pursued them with a still larger force, and the two armies met at Philippi. The republican army was totally defeated (November, 42 B. C.); both Brutus and Cassius killed themselves.

The victors now divided the Roman world among themselves,—Antony taking the East, Octavius the West, and Lepidus the province of Africa. But the Roman world was scarcely theirs before they began to quarrel over it. The feeble Lepidus never possessed much influence, and was soon robbed of his share. After this it was quite certain that a contest between Antony and Octavius could not long be delayed, and each began to intrigue against the other.

ANTONY'S TRAGIC ASSOCIATION WITH CLEOPATRA

Antony made the headquarters of his half of the Roman dominion at Alexandria. Here he came under the fascinations of Cleopatra, and he lost all regard to his character or his interests in her company. He even went so far as to divorce his wife Octavia, the sister of Octavius, and, having married the voluptuous Egyptian queen, he bestowed Roman provinces on her.

This conduct was treasonable, and furnished Octavius with a decent pretext for declaring war. The young Cæsar had been gaining great popularity in Italy; he had consolidated his power and had his legions in fine training. The fleets and armies of the rivals assembled at the opposite sides of the Gulf of Ambracia. After considerable delay, Antony, instigated by Cleopatra, who was present with her Egyptian fleet, determined to decide the contest by a naval battle. The contest took place off the promontory of Actium (on the west coast of Greece), while the hostile armies, drawn up on the shore, were simple spectators. In the midst of the conflict Cleopatra tacked about, and with the Egyptian squadron of sixty sail drew out of the fight. Antony, regardless of his honor, followed after her, and the pair fled to Alexandria. Both the fleet and the force of Antony surrendered to Octavius, 31 B. C.

Some months afterwards Octavius advanced to besiege Alexandria. Antony attempted to defend it; but he was abandoned by his troops. Cleopatra retired to a monument she had erected, and caused a report to be spread of her death. Upon this news Antony attempted to commit suicide, and inflicted on himself a mortal wound: hearing, however, in the midst of his agonies, that Cleopatra still lived, he caused himself to be carried to her monument, and expired in her presence (30 B. C.).

DEATH OF CLEOPATRA BY SUICIDE AND FALL OF EGYPT

The end of Cleopatra was even more tragic. The Egyptian queen seems at first to have thought that she would be able to bewitch the young Cæsar; but having in vain essayed her arts on the cold, calculating Octavius, she, sooner than be led in chains to adorn the triumph of the victor, and glut the eyes of the populace of Rome with the sight of the daughter and last of the Ptolemies, preceding the chariot of the adopted son of him who had done homage to her charms, gave herself voluntary death by the bite of an asp, or the scratch of a poisoned needle. Egypt now became a Roman province in 30 B. C., and Rome's dominion in the Mediterranean basin became formally, as it had long been virtually, complete.

The Roman Empire, replacing the Roman Republic, founded by Julius Cæsar, after the battle of Pharsalia, was consolidated by Octavianus in the following year.

V. PERIOD OF THE ROMAN EMPIRE TO CONSTANTINE, 31 B.C.-306 A.D.—The *fifth* period begins with the establishment of the Imperial Government under Augustus Cæsar to the reign of Constantine, A.D. 306. As Christianity was introduced into the world in this period, and was opposed until the end of it by the Roman government, it is often designated as the period of Pagan Emperors.

The reign of Augustus, the name taken by the first Emperor Octavius, has become proverbial for an age flourishing in peace, literature, and the arts. It is distinguished, also, for the birth of Jesus Christ; as the next reign, that of Tiberius, is, for his crucifixion and death.—The four reigns succeeding, viz.: those of Tiberius, Caligula, Claudius, and Nero, are chiefly memorable for the tyranny of the Emperors, and the profligacy of their families and favorites.

On the death of Nero, A.D. 69, follows a year of dissension and bloodshed, in which Galba, Otho, and Vitellius successively gained the empire and lost their lives.—The Flavian family, Vespasian and his two sons, Titus and Domitian, next in order receive the supreme power. Titus is celebrated as the final conqueror of the Jews, whose obstinacy provoked him to destroy the city of Jerusalem. Domitian, the last emperor of the family, provokes his own assassination, A.D. 96.

Passing the reigns of the feeble Nerva, the martial Trajan, and the peaceful Hadrian, we arrive at a brilliant age in the imperial history, the age of Antonines, extending from A.D. 138 to 180, a space of about forty years. Literature and the arts of peace revived under their benign influence.

After the death of Marcus Aurelius, A.D. 180, there follows a whole century of disorder, profligacy, conspiracy and assassination. The army assumes the absolute disposal of the imperial crown, which is even sold at public auction to the highest bidder. Within the last fifty years of the time, nearly fifty emperors are successively proclaimed, and deposed or murdered.—In the year 284, Diocletian began to reign, and attempted a new system of administration.

Ten special persecutions of Christians are recorded and described, the first under Nero, A.D. 64, and the last under Diocletian, commencing A.D. 303, and continuing ten years, unto A.D. 313. But, notwithstanding these repeated efforts to hinder the progress of Christianity, it was spread during this period throughout the whole Roman Empire.

ROME IN THE AUGUSTAN PERIOD

When Augustus Cæsar at the age of thirty-six became master of the Roman world, there was no open establishment of a monarchical government. On the contrary, most of the old republican forms were kept up; but they were mere forms. The Senate still sat, but it did little more than vote what Augustus wished; the people still met in their assemblies and elected consuls and magistrates, but only such persons were elected as had been proposed or recommended by the Emperor. Augustus, however, assumed nothing of the outward pomp of a monarch: he was satisfied with the substance of supreme rule.

THE THREE CIVILIZATIONS WITHIN THE EMPIRE

Within the circuit of the Roman dominion there were what we may call three civilizations: the Latin, the Greek, and the Oriental. Latin civilization took in the countries from the Atlantic Ocean to the Adriatic; Greek civilization, from the Adriatic to Mount Taurus; Oriental civilization, the lands beyond to the Euphrates.

THE LATIN.—The area of Latin civilization embraced the peninsula of Italy (its native seat) and all western Europe, where the Romans appeared not only as a conquering but also as a civilizing people. Thus in the three provinces of Spain (Hispania), in the four provinces of Transalpine Gaul (corresponding nearly with the modern France), as well as in the North African provinces, especially Carthage (which was restored by Cæsar as a Roman colony), the Latin language took firm root, and the manners and customs, and indeed the whole civilization, of those lands became Roman.

THE GREEK.—Greek civilization was spread over Greece and all those parts of Europe and Asia that had been Hellenized by Grecian colonists or by the Macedonian conquerors. In manners, customs, language, and culture these lands remained Greek, while politically they were Roman.

THE ORIENTAL.—Oriental civilization was diffused over the Eastern provinces, especially Egypt and Syria. These countries had, under the rule of Alexander's successors, become to some degree Hellenized; but this influence was on the whole superficial. The peoples of those Oriental lands had never given up their own languages or religious ideas or ways of thinking. Now these peoples, it should be said, did not become Latinized either,—they did not adopt the language and civilization of Rome.

HOW ROME WAS GOVERNED UNDER THE EMPIRE

Within the limits of the Roman Empire under Augustus there may have been in all one hundred millions of human beings. Not less than one-half were in a condition of slavery; and of the rest, only that small proportion who, under the envied name of Roman citizen (*civis Romanus*), inhabited Italy, enjoyed political independence, or had the smallest share in the government. The various lands and peoples were under Roman legates (half of these appointed by Augustus and the other half by the Senate), who held supreme military command. To the provinces were left, however, their independent municipal constitutions and officers. In Rome and Italy the public peace was preserved by the pretorian cohorts,—bodies of soldiers of tried valor, to whom Augustus gave double pay. Throughout the provinces the people were kept in check by the regular troops, —numbering three hundred and fifty thousand men.

THE CAPITAL CITY OF THE ROMAN EMPIRE

Of this vast empire Rome was the metropolis, now a city of innumerable streets and buildings, and containing, it is calculated, a population of about two millions and a half. It was in this period that Rome became truly a splendid city. Augustus was able to boast that "he found the city brick and left it marble."

ITS EXTENT AND CHIEF BUILDINGS.—In the days of its greatest prosperity the circumference of Rome enclosed by walls was about twenty miles; but there were also very extensive suburbs. The walls were pierced by thirty gates. The most remarkable objects were the

Coliseum, the Capitol with its temples, the Senate-House, and the Forum.

The great circus, or Circus Maximus, a place reserved for public games, races and shows, was one of the most magnificent structures of Rome. It was capable of containing two hundred thousand spectators.

The Flavian Amphitheater, whose massive ruins are known as the Coliseum, could seat from eighty to one hundred thousand persons. In the arena were exhibited the fights of gladiators, in which the Romans took such savage delight, together with races, combats of wild beasts, etc. Theaters, public baths, etc., were erected by the emperors, who seemed anxious to compensate the people for their loss of liberty by the magnificence of their public shows and entertainments.

The Ancient Roman Forum.—In the valley between the Palatine and Capitoline hills was the Forum, or place of public assembly, and the great market. It was surrounded with temples, halls for the administration of justice (called *basilicæ*), and public offices; it was also adorned with statues erected in honor of eminent warriors and statesmen, and with various trophies from conquered nations.

Temple of Janus.—In the Forum was the celebrated Temple of Janus, built entirely of bronze and dating back to the early kingly period. From some early circumstance the custom was established of closing the gates of this temple during peace; but so incessant were the wars of the Romans, that during eight centuries the gates of the Temple of Janus were closed only three times.

Campus Martius.—The elections of magistrates, reviews of troops, and the census or registration of citizens, were held in the Campus Martius, which was also the favorite exercise-ground of the young nobles. It was surrounded by several splendid edifices; ornamental trees and shrubs were planted in different parts, and porticoes erected under which the citizens might continue their exercise in rainy weather. Nearby was the celebrated Pantheon, or Temple of All the Gods (erected in the reign of Augustus), the most perfect and splendid monument of ancient Rome that has survived the ravages of time.

The Roman Aqueducts.—The Aqueducts were among the most remarkable Roman structures. Pure streams were sought at a great distance, and conveyed in these artificial channels, supported by arches, many of which were more than a hundred feet high. Under the emperors, not fewer than twenty of these stupendous and useful structures were raised; and they brought such an abundant supply of water to the metropolis, that rivers seemed to flow through the streets and sewers.

Compared with Athens.—Rome was inferior to Athens in architectural beauty, but it far surpassed the Grecian city in works of public utility. To enumerate all the notable edifices would be impossible here; but the "Eternal City" in the zenith of its glory contained four hundred and twenty temples, five regular theaters, two amphitheaters, and seven circuses of vast extent. There were sixteen public baths, built of marble, and furnished with every convenience that could be desired. From the aqueducts a prodigious number of fountains was supplied, many of which were remarkable for their architectural beauty. The palaces, public halls, columns, porticoes, and obelisks were without number, and to these must be added the triumphal arches erected by the later emperors.

As a Center of Literature

As the peace of the Roman world was maintained by the strong hand of power, it was at this time that many of those arts that grow best during seasons of national order and prosperity made their greatest progress. Thus many of the best-known Latin writers lived at this time.

Augustus himself was a great patron of literary men and artists, and so was his minister, Caius Cilinius Mæcenas. They honored and rewarded eminent writers; and though we must not forget that many of the distinguished men whose writings add luster to the "Augustan Age" had grown up under the republic, still Augustus deserves credit for fostering letters. Nothing will make up for the loss of political freedom; but it is something that in Rome, when liberty was lost, literature at least flourished.

Among the distinguished writers of this age or the times immediately preceding it are the poets Virgil, Horace, Lucretina and Catullus; and the historian, Sallust.

The Birth of Christ and the Christian Era

Under the rule of Augustus the greatest event of the world's spiritual history occurred in Bethlehem of Judæa—the birth of Jesus Christ. This really took place in the year 4 B.C., but the erroneous calculation has, for the sake of convenience, been allowed to stand, and the chronology passes from B.C. to A.D., when Augustus had held sway, according to the wrong reckoning, for twenty-seven years.

Great Importance of the Roman Defeat by the Germans

The great secular fact of Rome's history under Augustus Cæsar was the destruction of the Roman general Varus and his legions in Germany by the celebrated Arminius,—the great national hero Herman,—in whose honor a colossal statue has been erected in the northwest of Germany, near the scene of his patriotic and momentous achievement. He was the chief of the Cherusci, a powerful tribe dwelling on both sides of the river Visurgis (Weser), and closely akin to the Angles and Saxons who conquered the island of Britain.

If Arminius had not done what he did against Rome, Germany might have been thoroughly subdued; the Latin language might have extinguished the Teutonic; the Teutonic tribes might have been overwhelmed; the Teutonic influence over modern Europe, and as an element of the English race, might never have been exerted, and Europe and the world would have had a widely different development from that which they have actually undergone.

Legions of Varus Vanquished by Arminius

Arminius, as chief of the Cherusci, headed a confederacy of German tribes to expel from

northern Germany the invaders and partial conquerors of the fatherland. The Roman governor, Quintilius Varus, and his officers and troops, had provoked the German outbreak by their licentious behavior, and the vengeance wreaked on the offenders was complete in itself, and effectual for the preservation of German freedom.

The German hero, when his plans were formed, tempted Varus and his three legions, by a revolt of the tribes near the Weser and the Ems, to march into the difficult country now called the Teutoburger Wald, a woody and hilly region near the sources of the Lippe and the Ems. When the Roman force was thoroughly entangled amidst the forests and hills, and had been further imperiled by the rashness of the incompetent tyrant Varus in the order of his march, then Arminius and the Germans fell on the hated foe; the Roman column was broken, and its cavalry fled, but was pursued and utterly destroyed.

Varus slew himself in despair. His infantry was overpowered and slain almost to the last man. All the efforts of Rome thereafter never secured her a permanent foothold on German soil. This great deliverance of Germany, so full of chagrin to Augustus and so momentous in European history, occurred in A.D. 9.

Death of Augustus.—Augustus died in 14 A.D.; so that, counting from his formal accession to title, 27 B.C., he ruled over the Roman dominion for forty-one years.

The following table gives a list of the Roman Emperors, with the dates of their reigns and other facts. Many of them were quite insignificant in personality and in their influence upon history. The greater rulers call for more extended notice in their proper historical place in the Outline of Universal History, as well as in the Dictionary of Biography.

THE EMPERORS OF ROME

Name, Lineage or Basis of Accession and Cause of Death	Period of Rule	Birth	Death
THE CÆSARS			
Octavianus Cæsar, "Augustus" (majesty).—A title conferred by the Senate; died August 19	B.C.27-A.D.14	B.C.63	A.D.19
Tiberius (Claudius Nero).—Stepson of Augustus; murdered by a tribune	A.D.14-37	42	37
Caius Caligula.—Youngest son of Germanicus, nephew of Tiberius; poisoned by his wife, Agrippina, to make way for	37- 41	12	41
Claudius I. (Tiberius Drusus).—Grandson of Tiberius	41- 54	10	54
Claudius Nero.—Son of Domitius Ahenobarbus; deposed; kills himself	54- 68	A.D.37	68
Servius Sulpicius Galba.—Proclaimed Emperor; slain by the prætorians	68- 69	B.C. 3	69
M. Salvius Otho.—Proclaimed Emperor; stabbed himself	69-	A.D.32	69
Aulus Vitellius.—Proclaimed Emperor; deposed by Vespasian, and put to death	69- 69	15	69
Titus Flavius Vespasian.—Proclaimed Emperor	70- 79	9	79
Titus (Vespasian).—Son of Vespasian	79- 81	41	81
Titus Flavius Domitian.—Brother of Titus, second son of Vespasian; last of the *twelve* Cæsars	81- 96	51	96
THE FIVE GOOD EMPERORS			
Cocceius Nerva.—Proclaimed Emperor	96- 98	32	98
Trajan (M. Ulpius Crinitus).—Adopted son of Nerva	98-117	53	117
Hadrian (Publius Ælius).—Nephew of Trajan	117-138	76	138
Antoninus Titus, surnamed Pius.—Adopted son of Hadrian	138-161	86	161
Marcus Aurelius Antoninus.—Nephew of Antoninus Pius	161-180	121	180
THE PERIOD OF MILITARY DESPOTISM			
Commodus (L. Aurelius Antoninus).—Son of Marcus Aurelius; poisoned by his favorite mistress, Martia, December 31	180-193	161	192
Publius Helvius Pertinax.—Proclaimed Emperor; killed by prætorian band	193-	126	193
Didius Julianus.—Proclaimed Emperor	193-	.....	193
Lucius Septimus Severus.—Proclaimed Emperor; died at York, in Britain	193-212?	146	211
M. Aurelius Caracalla and Septimius Geta.—Son of Septimius Severus; Caracalla murders Geta, 212; is slain by his successors	212-217	188	217
M. Opilius Macrinus, prefect of the guards; beheaded in a mutiny	217-218	164	218
Heliogabalus (M. Aurelius Antoninus), a youth (Elagabalus).—First cousin of Caracalla; put to death for enormities	218-222	205?	222
Alexander Severus.—Cousin of Heliogabalus, by whom he was adopted; assassinated by soldiers corrupted by Maximinus	222-235	205	235
Caius Julius Verus Maximinus.—Elevated by soldiers; assassinated in his tent	235-238	173	238
M. Antonius Gordianus and his son; the latter falling in battle with partisans of Maximinus, the father strangled himself in despair, at Carthage, in his eightieth year.—Appointed by the Senate	238-238	.....	(238 (238
Gordian II.—Grandson of Gordian I.; assassinated by guards, instigated by Philip the Arabian	238-244	224	244
Philip the Arabian.—Murdered Gordian and usurped the throne; assassinated by his soldiers	244-249	.....	249

THE EMPERORS OF ROME—Continued

Name, Lineage or Basis of Accession and Cause of Death	Period of Rule	Birth	Death
THE PERIOD OF MILITARY DESPOTISM—Continued			
Metius Decius.—Proclaimed Emperor by the army; he perished in battle with Goths	249-251	.....	251
Gallus Hostilius, and his son Volusianus.—Elected Emperor by Senate and soldiers; both slain by soldiers	251-254	.....	254
Æmilianus.—Elected Emperor by Senate and soldiers; put to death after reign of four months	254-	208?	254?
Valerian.—Elected Emperor by Senate and soldiers; taken prisoner by Sapor, king of Persia, and flayed alive	254-260	.....	260
Gallienus	260-268	.....	268
Flavius Claudius	268-270	214	270
Aurelian.—Designated by Claudius; assassinated by soldiers on march against Persia	270-275	212	275
Tacitus.—Elected by Senate and soldiers; died at Tarsus, in Cilicia	275-276	200	276
Florian.—Proclaimed Emperor; not recognized by Senate	276-276	.....	?
M. Aurelius Probus.—Choice of the army; assassinated by troops at Sirmium	277-282	.....	282
M. Aurelius Carus.—Elevated to throne by soldiers; killed at Ctesiphon by lightning	282-283	222	283
Carinus—Elder son of Carus and Numerian.—Son of Carus... both assassinated	284-284	.....	285
Diocletian.—Proclaimed Emperor by the army and Maximian.—Made Cæsar by Diocletian	284-305	245	313 310
Constantius and Galerius Created Cæsar	305-306	250	306 311
Constantine the Great.—Eldest son of Augustus Constantius Chlorus	306-336	272	337
Constantius II.—Third son of Constantine the Great	336-361	317	361
Julian the Apostate.—Son of Julius Constantius; mortally wounded in battle with Persians	361-363	331	363
Jovian.—Elevated to the throne by the army	363-364	332	364
ROMAN EMPERORS OF THE WEST			
Valentinian I.—Proclaimed Emperor by the army	364-375	321	375
Gratian.—Son of Valentinian I	375-383	359	383
Maximus.—Made Emperor by the legions in Britain	383?	?	398
Valentinian II.—Son of Valentinian I	383?-388	371	392
Eugenius.—Proclaimed Emperor	388-394	.....	.....
Theodosius the Great.—Son of Theodosius, a Romal general	394-395	346	395
Honorius.—Second son of Theodosius	395-423	384	423
Valentinian III.—Son of Constantius	423-455	419	455
Maximus Petronius.—Proclaimed Emperor	455-	395?	455
Avitus.—Assumed the purple	455-457	.....	457
Majorian or Majorien.—Elected by Ricimer	457-461	.....	?
Severus.—Raised to imperial dignity by Ricimer	461-467	.....	465-7?
Anthemius.—Son-in-law of Emperor Marcian	467-472	.....	?
Olybrius.—Made Emperor through influence of Ricimer	472-473	.....	?
Glycerus.—Proclaimed Emperor (or Genseric)	473-	.....	?
Nepos.—Proclaimed Emperor by order of Leo X	473-475	.....	480
Romulus Augustulus.—Son of Orestes	475-476	.....	476
Augustus is deposed and banished by Odoácer, who thus puts an end to the Western Empire of Rome.			

(See Chronology of the more important events under Rome in Comparative Outlines of Universal History.)

VI. FROM CONSTANTINE TO THE FALL OF ROME, 306-476 A.D.—The *sixth* period includes the remainder of Roman history, extending from the reign of Constantine to the Fall of Rome, when captured by the Heruli, A.D. 476. The reign of Constantine the Great imparts splendor to the commencement of this period. He embraced the Christian faith himself, and patronized it in the Empire, as did also most of his successors; on which account this may be called the period of the Christian Emperors.

One of the most important events of his reign, and one which had a great influence on the subsequent affairs of Rome, was the removal of the Government to a new seat. He selected Byzantium for his capital, and removed there with his court, giving it the name of Constantinople, which it still bears. He left his empire to five princes, three sons and two nephews; the youngest son, Constantius, soon grasps the whole, A.D. 360. By the death of Constantius, his cousin Julian received the purple, which he was already on his march from Gaul to seize by force. The reign of Julian, styled the Apostate, is memorable for his artful and persevering attempts to destroy the Christian religion, and his unsuccessful efforts to rebuild the Temple of Jerusalem, with the express purpose of casting discredit on the predictions of the Bible.

From the death of Julian, A.D. 363, to the reign of Theodosius the Great, A.D. 379, the history presents little that is important to be noticed, except the jealousies between the eastern and western portions of the Empire, which grew out of the removal of the court to Constantinople. Theodosius was the last emperor who ruled over both. In 395 he died, leaving to his sons Arcadius and Honorius separately the

east and west. From this time the Eastern portion remained distinct, and its history no longer belongs to that of Rome.

The western portion languishes under ten successive emperors, who are scarcely able to defend themselves against the repeated attacks of barbarian invaders. At length, under Augustulus, the eleventh from Theodosius, Rome is taken by Odoácer, leader of the Heruli, and the history of ancient Rome is terminated, A.D. 476.

The whole of the period from Constantine to Augustulus is marked by the continued inroads of barbarous hordes from the north and the east. But the greatest annoyance was suffered in the latter part of the time, from three tribes, under three celebrated leaders; the Goths, under Alaric; the Vandals, under Genseric; and the Huns, under Attila. The two former actually carried their victorious arms to Rome itself (A.D. 410 and 455), and laid prostrate at their feet the haughty mistress of the world; and the latter was persuaded to turn back his forces (A.D. 453) only by ignoble concessions and immense gifts.

By A.D. 300 great changes had passed over the empire. Its population had become largely barbarized; the armies contained great numbers of Goths, Vandals, and Sarmathians (from territory now the west and south of Russia). Germans were spread through the empire more than any other nationality. The former distinction as to Roman citizenship having been lost, the distinction between the "Roman legions" and the "allies" was now effaced, and the last visible record of Rome's conquest was obliterated.

PERIOD OF CONSTANTINE THE GREAT

Diocletian's resignation in A.D. 305 was followed by a period of confusion and civil war, which ended in the establishment of Constantine as sole emperor in A.D. 323. He was son of one of the co-emperors and the Empress Helena. Constantine made an important change in the government by separating the military power from the civil authority. The influence of the *Legati* (provincial viceroys) was thus reduced, and the fact that the emperor alone held both the civil and military power gave him a great predominance.

CONSTANTINE MAKES BYZANTIUM THE CAPITAL

In A.D. 324 Christianity was established by Constantine as the religion of the State, and in 330 he made Byzantium the capital of the empire. This city on the Thracian Bosporus, founded by Greek colonists in 658 B.C., had early become a great commercial center. After being held successively by the Athenians, Lacedæmonians, and Macedonians, it came into Roman possession, and the new or reconstructed city Byzantium was afterwards called *Constantinópolis* ("City of Constantine") and remained the capital of the Eastern Empire of Rome till A. D. 1453.

CONSTANTINE GIVES A NEW IMPETUS TO CHRISTIANITY

In religion, Constantine showed marks of his former Paganism even after his conversion to Christianity. He was an able general and statesman, whose real character has been obscured by historical excesses, both of panegyric and of detraction, and around whose name, in connection with Christianity, interesting and picturesque legends are associated, like that of the apparition of the Cross and the words (in Greek), "By this sign, conquer." He died in 337, leaving the empire to confusion and civil war under his sons.

Apart from its effects upon the morals, the new religion greatly and beneficially stirred the mind of the age. Political speculation and discussion were impossible under a despotism, and active minds turned to theology, and soon showed that the intellectual power of the time was to be found within the ranks of Christianity.

Among these early writers and rules of the church, known as the "Christian Fathers," the following are the chief, Tertullian, Ambrose, Cyprian, Lactantius, Jerome, and Augustine being Latin Fathers; Origen, Gregory, Basil, Chrysostom, and Athanasius being Greek Fathers.

THE IGNOBLE END OF THE WESTERN EMPIRE

The last Roman Emperor of the West was a child, called, as if in derision, Romulus Augustulus, the one name being that of the city's mythical founder, the other ("Augustus the little") a parody of the style of him who organized the empire. Augustulus became nominal ruler in A.D. 475, and in 476 was overthrown by the invasion of some German tribes, of which the chief were the Heruli. Their leader, Odoácer, took the title of "King of Italy," and the Western Empire came thus ignobly to an end.

CONTRIBUTIONS OF ROMAN SWAY TO THE WORLD

The chief benefits derived by the world from Rome's imperial sway were the spread of the Greek culture, the transmission of the greatest productions of the Greek mind, and the clear course made for the progress of Christianity.

THE DARK AND MIDDLE AGES

Modern history, in a comprehensive sense, begins with the downfall of the Western Roman Empire; for with that event the volume of ancient history was closed: new actors then appeared on the stage, and a new civilization arose.

THE ROMAN WORLD SUCCEEDED BY THE GERMANIC

The development of the German world begins, kindled by foreign culture, religion, polity, and legislation. These new elements were taken up by the Teutonic tribes, and amalgamated with their own national life.

THE HISTORIC DARK AGES

In many respects this period seemed a relapse into barbarism, and the interval from the fifth to the eleventh century is sometimes called specifically the Dark Ages. But in a juster view it was the germinating season: the seeds of modern civilization, cast into the soil, were quickening in new institutions and new

nations; so that when we see modern society in the fifteenth and sixteenth centuries assuming the fixed shape which it still wears, we must remember that it grew into that shape in the antecedent thousand years.

REAL NATURE OF THIS PERIOD

The most important historic features of the Middle Ages were certain peculiar forms of society, rather than the development of great nations. Indeed, the modern nations as such were only in their beginnings, and these characteristic social peculiarities were common to all of them. Thus, all the nations of Europe were under that peculiar form of society called *feudalism;* all bore certain relations to the *papal power;* all participated in the *Crusades* and in the spirit of *Chivalry;* and all passed through the period named the *Dark Ages*, and shared in the intellectual revival which marked the latter part of the Middle Ages.

THE EASTERN OR BYZANTINE EMPIRE.—This Empire, called also the Greek Empire, was sustained under various fortunes, for a period of almost one thousand years after the overthrow of the Western or Roman Empire. After the fall of Rome nearly sixty different emperors had occupied the throne at Constantinople, when, A.D. 1202, that city was taken by the crusaders from France and Venice. By this event the Greek emperors were forced to establish their court at Nicæa in Asia Minor. After the lapse of sixty years, their former capital was recovered; and, subsequent to this, eight different emperors held the scepter there, until the empire was gradually reduced in strength and extent, and it consisted of but a little corner of Europe. Its existence was prolonged to A.D. 1453, when Constantinople fell into the hands of the Turks, who have retained it to the present day.

While the new nationalities and the new civilization of Western Europe were being developed under the influence of German vigor, the emperors at Constantinople, though they ruled dominions where the language and civilization were mainly Greek, still claimed to be Roman emperors, and under their sway the laws and official forms of imperial Rome were maintained.

The Patriarch of Constantinople was the head of the Christian Church in the East, as the Bishop of Rome was in the West, while the latter, as the successor of St. Peter, was the head of the universal Church.

NOTABLE REIGN AND SERVICE OF JUSTINIAN

The Eastern Empire attained its acme in the sixth century, during the reign of Justinian, A.D. 527-565. It was he who built the great Church of Saint Sophia at Constantinople, now a Mohammedan mosque. His chief service to mankind, however, was the codification of the laws in the great system of Roman jurisprudence called the Civil Law, forming the basis of the law in European states at the present day.

CONQUESTS OF THE FAMOUS GENERAL BELISARIUS

In the East, the famous Belisarius, an Illyrian of plebeian birth, fought for Justinian against the Persian king Chosroes I. (or Nushirvan), who reigned A.D. 531-579. Justinian purchased peace by payment of tribute to this Oriental despot, whose empire extended from the Red Sea to the Indus.

In the West, Justinian's arms had great success. In 534 the Vandal kingdom in Africa was brought to an end by the victories of Belisarius. In 535 Belisarius conquered Sicily, and from 535-540, and again from 541-544, fought the Goths in Italy, until the jealousy of his master recalled him.

His successor in command, Narses, completed the overthrow of the Ostrogothic kingdom in Italy by his campaigns in 552-553. Under Justinian, the Visigoths were driven out of the south of Spain, so that there was for a time a revived Roman Empire of the West, embracing nearly the whole of the Mediterranean coasts. Justinian died in 565, and a speedy change came in Italy.

LOMBARDS CONQUER AND CONTROL ITALY UNTIL TIME OF CHARLEMAGNE

The warlike Germans called Lombards had settled in Pannonia (south of the present Austrian Empire), by Justinian's invitation, about 540. They fought to extermination the Gepidæ (Goths), and in 568 passed over the Alps into the fertile plain of northern Italy.

Under their king Albion, the Lombards subdued the north and much of the south of Italy (the central part, including Rome and Ravenna, on the Adriatic, with Sicily, Corsica, and Sardinia, remaining still Roman), and the Lombard kingdom of Italy thus formed continued for two centuries, until conquered by Charlemagne.

The growth of Venice dates from this Lombard conquest, when the victims took refuge in the islands and lagoons at the head of the Adriatic Sea, where a town had been founded by fugitives from the Huns.

THE EMPIRE OVERRUN BY PERSIANS AND GREEKS

The flourishing period of the Eastern Empire closes for a long time with Heraclius, who died in A.D. 641. The Persians and the Turks (Mongolians from Asia), with their kinsmen the Avars attacked the empire with formidable strength. Between 611 and 615 the Persians overran Egypt, Syria and Asia Minor, remaining encamped for ten years within sight of Constantinople. Heraclius, between 620 and 628, recovered the Persian conquests.

DECLINE OF THE EASTERN EMPIRE AND CONQUEST BY THE TURKS

For the next four hundred years the Empire enjoyed a period of comparative prosperity, marked by successful defense against Saracens and Bulgarians. From 1204 to 1261 it fell under the sway of the French and Venetians, who jointly established the so-called Latin dynasty. From this period on for almost a hundred years its decline was steady, and, in 1453, the empire was brought to a close with the capture of Constantinople by Mohammed II.

MOSQUE NEAR BAGDAD, THE EASTERN CAPITAL OF THE SARACEN EMPIRE

THE SARACEN EMPIRE: ITS FANATICISM, ART AND LEARNING

Saracen (Arab. *Sharkiin*, the eastern people, from *Sharq*, the East), is a term applied to the first followers of Mohammed or Mahomet who within forty years after his death, 632 A.D., had subdued a part of Asia and Africa. The Saracens conquered Spain in 711 and following, but were defeated at Tours, France, by Charles Martel in 732. Under Abd-el-rahman they established the caliphate of Cordova in 755, which gave way to the Moors in 1237. The empire of the Saracens closed with the capture of Bagdad by the Tartars, 1258.

We now come to a remarkable chapter in European history,—the invasion of Europe, the land of the Aryans, by a Semitic race, the followers of the famous Mohammed. Connected with this is the rise of the new religion and of a vast dominion that played a great part in the history of the Middle Ages. The latter only can be touched on here.

THE "KORAN" BECAME THE BASIS OF BOTH RELIGION AND EMPIRE

The doctrines of Mohammed, written down from time to time, received the name of the Koran,—that is, the "Reading"; and the religion itself was called *Islam*, or Mohammedanism—that is, "Salvation."

THE HEGIRA OR FLIGHT OF MOHAMMED

His wife and a few other immediate relatives were the prophet's first disciples, and these did not increase very rapidly. The people of Mecca denounced him as a madman or an impostor, and in a little time he was forced to flee from Mecca to save his life. He betook himself, with his disciples, to what is now Medina. The date of this flight, or *Hegira*, as the Arabians call it,—July 15, 622 A.D.,—has been adopted ever since as the chronological era in Mohammedan countries. At Medina he was received with open arms,—his doctrines having already made a number of converts in that place; and here he built his first mosque.

HIS RELIGION SPREAD BY THE SWORD

A complete change now came over Mohammed,—the dreamer became a red-handed soldier. "The sword," cried he, "is the key of heaven and hell," and by the sword Islam was to be forced upon all men. Tribe after tribe was subdued; and before the lapse of ten years the whole Arabian peninsula acknowledged the sovereignty of Mohammed, and could boast of an unmixed population of *Moslems*, or True Believers. The prophet was preparing to carry the new religion beyond the bounds of Arabia, when he was cut off by a fever at Medina in A.D. 632.

EMPIRE EXTENDED BY CONQUESTS OF THE CALIPHS

Mohammed was succeeded in his power by rulers called his *Caliphs*, or Successors, the first of whom was his father-in-law, Abu-beker. They were at once spiritual and temporal rulers. The proselyting spirit of Mohammed had been communicated to his successors, and they began a long series of invasions, wars, and conquests. They everywhere gave men the choice of three things,—Koran, tribute, or sword. By these means the religion of Mohammed was spread over a large part of Asia and Africa, and made its way into Europe also.

SARACEN CONQUESTS IN THE EAST

The first countries assailed were the Oriental possessions of the Byzantine Empire. In the reign of Abu-beker, Syria and Mesopotamia were subdued by Arabian armies. Under the next caliph, Omar, Egypt was conquered and Northern Africa overrun. The Arabs, or Saracens, as they were also called, met with comparatively little resistance in the Oriental countries, the countries beyond Mount Taurus; and this may be accounted for by the fact that these were the parts of the Roman Empire in which both Roman law and Christianity had taken least hold.

Thus the Eastern Empire was shorn of all its Oriental possessions; and even the farther East—Persia and the lands beyond, to India—was added to the Moslem dominion.

THE FURY OF CONQUEST IN THE WEST

In the West, however, a stout resistance was encountered. The Saracens besieged Constantinople, against which they carried on a siege of eight years (A.D. 668-675); but every assault was repelled by torrents of terrible Greek fire. A second siege, forty years afterward, met a like result. In North Africa, too, they encountered long and obstinate resistance; but finally the whole northern coast—Cyrene, Tripoli, Carthage—was subdued; and in A.D.710 a host of turbaned Arabs, with unsheathed scimitars, under Tarik-ben-Zaid, crossed the narrow strait into Spain and landed on the rock which commemorates the name of their leader ("Gibraltar," i. e., *Jebel Tarik*, the Mountain of Tarik).

SUBJUGATION OF SPAIN AND SOUTHERN GAUL

It will be remembered that a Visigothic kingdom had been established in Spain; but Roderick, the "last of the Goths," was defeated on the field of Xeres, and the Saracens established themselves firmly in Spain. In the course of a few years they had possession of the whole peninsula, with the exception of the mountainous districts in the north, where the little Christian kingdom of the Asturias maintained itself.

The ambition of the Saracens now overleaped the Pyrenees. They obtained a foothold in Southern Gaul; and after a time an able Saracen commander, Abd-el-rahman, led a powerful Mohammedan army northward to subdue the land of the Franks. As far as the Loire everything fell before him, and it seemed that all Europe would come under Moslem sway.

THEIR DEFEAT BY CHARLES MARTEL

It was in the hour of need that Charles Martel appeared as a champion for Christendom. Gathering a powerful army, he met the Saracens between Tours and Poitiers (*pwät-yea'*). A desperate battle, which lasted for seven days, ensued; but on the seventh day the Saracens were defeated with great slaughter, A.D. 732.

This victory arrested forever the progress of the Mohammedan arms in Europe, and procured for Charles the expressive surname of "the Hammer" (*Martel*), by which he is known in history.

While the Saracens were stopped from pushing their conquests farther into Europe, they firmly established themselves in Spain, where they founded a kingdom that lasted for seven hundred years,—that is, till the very close of the Middle Ages.

DIVISION OF SARACENIC EMPIRE

For a short time the vast dominion which the Saracens had conquered held together, and a single caliph was obeyed in Spain and in India. But soon disputes arose as to the right of succession to the caliphate: wars and secessions took place, and in A.D. 755 the Saracenic

empire was divided,—one caliph reigning in Spain and another in Bagdad.

In the East, the most distinguished of the Saracenic rulers was Haroun-al-Raschid (Aaron the Just), who became caliph in A.D. 786, and was a contemporary of Charlemagne. In the *Arabian Nights* we find a vivid picture of the city he ruled and the life he led. After the death of Haroun, the Eastern dominion of the Saracens was rent by civil strife; one province after another broke off from the caliphate, till in the eleventh and twelfth centuries it fell a prey to the Turks.

SARACENS SUCCEEDED BY THE MOORS IN SPAIN

In Spain, on the division of the Saracenic power, the rule was in the hands of the Ommiyad line, and the capital was at Cordova. From this city the scepter of the Ommiyades ruled during 283 years (from A.D. 755-1038); but in the eleventh century the supremacy of the Saracens gave place to the Moorish empire in Spain.

SARACEN CONTRIBUTIONS TO LEARNING AND ART

In the intellectual history of the Middle Ages the Saracens played a remarkable part. When Europe was sunk in the grossest ignorance, this clever people were actively engaged in the cultivation of science, learning, and the arts. The schools of Cordova vied with those of Bagdad in the collection of books and the encouragement of science, and from them proceeded nearly all that was original in the medicine, physics, and metaphysics of Europe during the Middle Ages.

GERMANIC EMPIRE OF CHARLEMAGNE

Charlemagne may be regarded as the chief regenerator of Western Europe after the dissolution of the Roman Empire. At the date of his coronation, 800 A.D., his empire was not inferior in extent to that of the old Roman Empire. He was master of all Germany and Gaul, the greater part of Italy, and part of Spain. Under him the Frankish dominion reached its highest point, and marks the formal termination of an antiquated state of society. It was also the introduction to another totally different form itself and from its predecessor. It was not barbarism, it was not feudalism; but it was the bridge which united the two.

The most important chapter in the history of the Middle Ages is that informing us how the ruins of the dilapidated Western Empire were for a time rebuilt into an imposing structure by the genius of a great man, the grandest figure of the Middle Ages,—Charlemagne. The real name of this great man was Karl, that is, Charles. Though best known by his French name of Charlemagne (Charles the Great), we must remember that he was not a Frenchman in our sense of the term, but a thorough Teuton, or German, in birth, instinct, speech, and residence.

WHAT THE DOMINIONS OF CHARLEMAGNE COMPRISED

The kingdom of the Franks, to which Charlemagne fell heir on the death of his father, formed an extensive dominion comprising portions of the two countries we now call France and Germany,—for it must be remembered that the specific countries, France and Germany, did not yet exist at all.

At this time—the latter half of the eighth century—Italy was divided between the Lombards and the Eastern emperors, England had come into existence, but only as a number of feeble and warring states, Spain was under the rule of the Moslems. In the meantime the land of the Franks was lifting itself from out the surrounding barbarism of the new races, and was the center of that Germanic civilization which was struggling into existence.

It is important to bear in mind the actual condition of the European world at the time Charlemagne came on the stage, for it will help us to understand the work he did, how far he succeeded and how far he failed.

THE CENTRAL PLAN OF CHARLEMAGNE'S EMPIRE

The ruling idea of Charlemagne was the re-establishment of the Roman Empire,—the building up on German soil of that colossal power which had toppled over because it rested on the too narrow basis of Latin nationality. In executing this design he aimed to use all the elements of civilization that the times presented, and especially these two great elements,—the political ideas and instincts of the Teutons, and the adhesive power of the Christian Church. Hence we find him, throughout his whole career, carefully cherishing all those old

German institutions upon which the mass of his people looked with deep reverence, while at the same time we behold him the protector of the Pope and the loyal and ardent champion of the Church.

OBJECT OF HIS WARS AND HIS CHIEF FOES

It was in the effort to realize his grand idea that Charlemagne undertook the numerous wars and expeditions that filled the forty-six years of his reign. We shall not enter into the details of these wars; but it is needful to understand their object and their result.

The most important of Charlemagne's military enterprises were directed against the fierce pagan nations of Germany and the wild Scythians in the outlying lands beyond. To appreciate the importance of these we must try to realize that the eastern frontier of the Frankish land, that is, the eastern boundary of Charlemagne's kingdom, on the German side of the Rhine, ran into and abutted on the extensive stretch of country in Middle Europe that was still in the hands of the various uncivilized tribes. As long as these peoples remained in their warlike, savage, and pagan condition, they would press heavily on the struggling civilization of the Frankish kingdom, and would endanger, if not utterly destroy, its progress. Hence to subdue and especially to Christianize these tribes—to extend the domain of organized and law-governed society into the desert waste of Teutonic barbarism—was a main object with Charlemagne.

HE SUBDUES THE SAXONS AND BAVARIANS

With the Saxon confederation, formed by various pagan tribes on the Weser and the Elbe (the same tribes from among which the Saxons and Angles, who conquered Britain three centuries before this, had gone forth), Charlemagne had the greatest trouble. He repeatedly marched into their country and subdued them; but they constantly rose up again, and it was only after some terrible acts of vengeance,—for example, he one day had forty-two hundred prisoners hanged,—that they at length submitted to be baptized and to become peaceable subjects.

Soon after this the Bavarians attempted to render themselves independent of the Frankish power by the assistance of the Avars, a Tartar race living in what we now call Hungary (then *Pannonia*). Charlemagne overpowered the Bavarians, incorporating Bavaria with his German territory; and then revenged himself on the Avars by conquering them, taking their treasures, and annexing Hungary to his dominion.

THE FIRST UNION OF THE GERMANS UNDER ONE HEAD

The result of Charlemagne's conquests on the east side of the Rhine was that Germany was for the first time all united under one head, and on that side the Frankish kingdom was extended to the confluence of the Danube with the Theiss and the Save.

Against the Saracens in Spain Charlemagne made an important expedition. The capture of Saragossa laid Aragon and Navarre at his feet, and he united the whole country as far as the Ebro to his own kingdom as a Spanish province. During his return the rear-guard under Roland, suffered a defeat in the valley of Roncesvalles, in which the bravest champions of the Franks were destroyed. This somewhat tarnished the laurels Charlemagne had won in Spain, but did not undo the substantial results of the campaign.

NORTHERN ITALY UNITED TO HIS EMPIRE

We must now see what Charlemagne did in Italy. At this period the Lombards were very troublesome to the Pope, and frequently assailed the Roman territory. Accordingly, when Pope Adrian I. called on Charlemagne for aid, the Frankish monarch crossed the Alps, defeated the Lombards, shut up their king in a monastery, and himself assuming the famous "iron crown" of Lombardy, united the whole of Upper Italy to the kingdom of the Franks (A.D. 773). At the same time he confirmed the gifts made by Pepin to the Pope.

The general result of all the wars and conquests which we have described was that by the year 800 Charlemagne, who had inherited from Pepin a kingdom scarcely equal to all Gaul, found himself lord of a dominion as large as the ancient Roman Empire of the West, and extending from the Ebro (in Spain) on the west to the Elbe in the northeast, the Theiss (Hungary) in the southeast, and includ-

ing half of Italy, with Corsica, Sardinia, and the Balearic Isles. He fell heir to a kingdom; he was now master of an empire.

CROWNED BY THE POPE AS EMPEROR OF THE WEST

The year A.D. 800 forms the climax of Charlemagne's reign. The sovereign had gone in splendid state to visit Italy. On Christmas day Charlemagne and his court were attending divine service in the church of St. Peter's, at Rome. Suddenly, while the monarch was kneeling on the steps of the altar in prayer, the Pope, Leo III., placed a crown upon his head and solemnly saluted him as "Emperor of the West," with the title of Charles I., Cæsar Augustus.

CHARLEMAGNE'S CONTRIBUTIONS TO THE CIVILIZATION OF HIS TIME

The latter years of Charlemagne's life were spent in labors for the consolidation of his empire and the elevation of his people. He was a great patron of learning and learned men. He was himself a good Latin scholar, and he knew something of Greek. Wherever he was he was usually surrounded by learned churchmen, whom he drew to his court from all quarters, and with whom he delighted to hold conversations on literary and other subjects. The emperor, his family, and all attached to his household formed what was called the "School of the Palace." Fond of literary pursuits, Charlemagne studied grammar, rhetoric, music, logic, astronomy, and natural history under his learned friends; and even after he was considerably advanced in years he took the pains to acquire the art of writing,—an accomplishment then very unusual except among churchmen.

HIS EFFORTS FOR EDUCATION OF HIS PEOPLE

Nor was the emperor's interest in education confined to his own household. Each of the numerous monasteries that he endowed was bound to maintain a school. He had copies of the writings of the ancient Romans made and distributed among the convents, he formed a collection of old German heroic ballads, and under his patronage church music was greatly improved.

CAPITAL AND FAVORITE RESIDENCE OF CHARLEMAGNE

Charlemagne's favorite place of residence was at Aix-la-Chapelle (in German, *Aachen*). He made this the northern capital of his empire, as Rome was the southern, and built a magnificent palace there. When his power was confirmed by his coronation as Emperor of the West, all the world hastened to pay him homage. The Saracen caliph, the famous Haroun-al-Raschid, who ruled the Eastern dominion of the Saracens, at Bagdad, exchanged courtesies with his great brother of the West, sending him, among other presents, an ape, an elephant, and a curious clock which struck the hours.

THE END OF CHARLEMAGNE'S GREAT EMPIRE

Charlemagne died at the age of seventy-two, at Aix-la-Chapelle, in A.D. 814. The year before, he had caused his only living son, Louis, to assume the imperial crown. But the vast structure that Charlemagne had raised during his lifetime tottered and fell almost immediately after his death. Louis, known as the Gentle (*le Debonnaire*), was better fitted for the repose of a cloister than for the government of a warlike kingdom. His sons, among whom he divided the empire, turned their arms first against himself and then against one another. Finally, in A.D. 843, a treaty was made at Verdun, by which France, Germany and Italy became separate and independent states; so that, in less than thirty years after the death of Charlemagne, the history of the FRANKS came to an end, and the history of FRANCE and of GERMANY began.

IX. FROM THE TREATY OF VERDUN TO THE SIGNING

GREAT EVENTS OF PERIOD. 900-1000: Norse ravages and conquests continue; also private order. Normans in Italy and Sicily. The Norman conquest of England; which as regards begin. 1100-1200: Quarrels between popes and emperors continue; zenith of papal power; of the feudal baronage. The Crusades. 1200-1300: Rise of universities and of mendicant recognized by the crown. Magna Charta.

A. D.	Spain	Britain	France	Germany	Italy
850			855. Kingdom divided. Louis II., Emperor, obtains Italy and Rhœtia till 875. Charles, Provence, till 863.		
	864-1131. Kingdom of Barcelona.	866. Invasion of the Danes.			
875		871-900. ALFRED THE GREAT.	876. Kingdom divided: Charles the Fat obtains Suabia and Alsace till 887.	Louis the Younger, Saxony and Thuringia till 882.	Carloman, Bavaria, etc. till 879; becomes King of Italy, 877.
	885-1512. Kingdom of Navarre.		884. Charles the Fat reunites the monarchy of the Franks.		
900		901-924. Edward the Elder, the first prince who takes the title of King of England.	Rollo, the Dane, forces Charles to confer on him the province of Normandy, and becomes:		
	912-961. Abderrahman III. *The greatest Arab prince of Spain; splendid edifices built; learning encouraged; commerce flourishes.*		912. Robert, Duke of Normandy; capital Rouen.	919-1024. Kings and Emperors of the Saxon house.	
925			*France is now divided among the powerful barons, who exercise sovereign power in their respective domains.*	919-936. Henry I., the Fowler, a great prince, consolidates the empire.	
950				936-973. OTHO the GREAT.	950-961. Berenger II. submitted to Otto as his suzerain.
				955. Decisive victory over the Huns, which leads to the consolidation of the margravate of Austria.	
				961-965. Otho's second expedition into Italy; he dethrones Berenger; is crowned king, and Emperor. 962. Makes Rome his capital.	
975				967. Otho II. crowned emperor.	
		978-1016. Ethelred the Unready. New invasion of the Danes.			
			House of Capet 987-996. HUGH CAPET. France, for a long period before and after the accession of the Capets, has no national history; the royal authority is now restricted to the city in which the court resides.		
1000	1000-1035. Sancho III., the Great, King of Navarre and Castile. There existed henceforward three Christian kingdoms in Spain: 1. Castile-Leon; 2, Navarre; 3, Aragon.	1017-1041. Danish kings. 1016-1035. Canute the Great, King of Denmark.		1002-1024. Henry, Duke of Bavaria, a just and pious king. Continual wars with the Poles and Italy.	Venice, Genoa, and Pisa rise in power, opulence and civilization.
				House of Franconia 1024-1039. Conrad II., the Salic.	
1025	*Golden Age of Arabian literature in Spain.* 1026. Hixem III. 1030. With him ends the Califate of the West.				1029. Settlement of the Normans in South Italy.
				1039-1056. HENRY III. He defeats the Bohemians and Hungarians, and makes both tributary. *The imperial power at its highest point.*	1041. They conquer Apulia from the Greeks; 1060, Calabria; 1060-1090, Sicily.
		1042. The Saxon line restored. 1042-1066. Edward the Confessor. French Normans become a new source of trouble.		1056-1106. Henry IV.	
1050				1059. **Quarrels between the Popes and Germany investitures and nomination to the**	

OF MAGNA CHARTA BY KING JOHN, 843-1215 A. D.

wars. 1000-1100: Increasing and beneficent power of the church exerted in the direction of good government far surpasses all other countries. Quarrels between popes and emperors Criticism revived. Private wars lessen; advance in power of kings and of towns at expense Friars. Quarrels between popes and emperors still continue. Last Crusades. English liberties

Church	Scandinavia and Slavs	Eastern Empire	Saracens	China, Japan, India	A. D.
860. **Separation of the Greek and Latin Churches.**	862. Russia: Rurik, first grand prince.			859. Japan: Powerful Seiwa family arises.	**850**
867. Pope Hadrian II., Photius, Patriarch of Constantinople, deposed.	863-1030. Norway: Harold Harfargar to St. Olaf.	867-1057. Eastern emperors of the Macedonian line.	870-892. Muattemed re-establishes the capital at Bagdad.		
872. Pope John VIII.					**875**
	895. Hungary: Magyars under Arpad enter the kingdom.	886-911. Leo VI., the Philosopher.			**900**
911. The Northmen in France embrace Christianity.				907-960. China: Period of five dynasties.	
927. Odo, abbot of Cluny, establishes celebrated code of discipline.		917. The Bulgarians besiege Constantinople.			**925**
		941. Russian expedition against Constantinople, under Igor.			**950**
		956. Armenia and the provinces between the Black and the Caspian Sea, recovered from the Saracens.			
959. St. Dunstan becomes Archbishop of Canterbury and attempts to reform the church; enforcing clerical celibacy.		959-963. Romanus II.		960. China: Tai Tsoo founder of later Sung dynasty.	
966. Poland receives Christianity under Miecislas.		964-975. Cyprus, Cilicia and Antioch are captured by Nicephorus; Syria is overrun, and, under Zimisces, the Greeks penetrate to the Tigris.	969. The FATIMITES become masters of Egypt, with Cairo as the capital.		**975**
989. Byzantine Christianity propagated in Russia by Vladimir the Great.		976-1025. Basil II.	980. Seljuk, a Turk officer of the khan of Tartary, becomes a Mohammedan, and settles in Samarcand.		
999. Pope Sylvester II.				1000-1186. India: Supremacy of Ghazni.	**1000**
	1019. Russia: Yaroslaff the Great.	1018. Bulgaria again reduced to a Grecian province.			
		1025-1028. Constantine IX. *Culminating point of Byzantine greatness. Greeks greatest merchants and capitalists of the world during this century.*		*Golden Age of Rajput civilization in India.*	**1025**
			1042. Turks invade and conquers Persia. The kingdom of Ghizni declines after 1032, and is confined to India; falls 1183.		**1050**
man Emperors respect-Holy See.		1057-1185. Eastern emperors of the houses of the Ducas and the Comnenes. Southern Italy lost to the Normans.			

IX. FROM THE TREATY OF VERDUN TO THE SIGNING OF

A. D.	Spain	Britain	France	Germany	Italy
			1060-1108. Philip I.		1060. Robert Guiscard, first duke.
	1072. Alfonso VI. of Castile, enlarges his dominions by conquests from the Mohammedans.	1066. Harold elected king, but is defeated and slain in the battle of **Hastings,** which gives England to William.	1066. William, Duke of Normandy, invades England.		1060-1090. Sicily conquered by Count Roger, brother of Robert. Robert invades the Greek Empire, and gains the battle of Durazzo.
1075		1066-1154. **Norman Kings.** 1066-1087. WILLIAM THE CONQUEROR.			
	1085. The Cid. Toledo is taken by Alfonso VI. after a three years' siege. 1086. The battle of Zalaca.	1087-1100. William II., Rufus. *Revolt of the Norman nobles. The feudal system established in England.*			
1100		1100-1135. HENRY I., Beauclerc. 1101. Robert, Duke of Normandy, invades England. 1103-1106. Henry invades and conquers Normandy.	1096. **The First Crusade.** Peter the Hermit and Walter the Penniless.	1106-1125. Henry V., Emperor of Germany and King of Italy.	
1125		**Wars between the French and English, and rise of rivalry between these two nations, which lasts for three centuries and a half.**		**House of Hohenstaufen** 1138-1152. Conrad I., elected emperor.	
	1139. Kingdom of Portugal.		1147. **The Second Crusade** preached by St. Bernard and joined by the Emperor Conrad and Louis VII. of France.		1139. The two Sicilies erected into a kingdom under Roger.
1150		1154-1399. **Plantagenets** 1154-1189. Henry II., Plantagenet.		*Rise of the factions of Guelfs and Ghibelines.* 1152-1190. Frederic I., Barbarossa, Emperor and King., one of the most heroic figures of the Middle Age.	1158. Venice a great maritime power.
		1159. War between France and England.	*The French language cultivated.*	1166. Frederic in Italy. League of the Italian cities, 1167, to preserve their liberties.	
1175		1171-1172. Conquest of Ireland.	1180-1223. Philip II., the greatest prince since Charlemagne.	1183. Peace of Constance re-establishes the independence of the Italian Republics.	
		1189-1199. Richard I. the Lion-hearted. Dreadful massacre of the Jews at his coronation.			
		1189. **Third Crusade** led by Philip Augustus, of France; Richard, of England; and Frederic Barbarossa.			
				1190-1198. Henry VI., Emperor and King of Italy and the Sicilies.	
	1195. Battle of Alarcon in which the Christians are defeated.				
1200		1199-1216. John usurps over Arthur, the son of his elder brother, Geoffrey.	1202. The **Fourth Crusade** under Boniface of Montferrat.	1198. Philip of Suabia and Otho of Saxony, dispute the crown; the former supported by the Ghibelines the latter by the Guelfs.	1204. Venice aggrandized by the conquest of Constantinople.
	1212. Battle of Navas de Tolosa; a victory for the Christians.	1201-1206. War with France; Philip espouses the cause of Prince Arthur.		1212-1250. Frederic II. becomes emperor and king of the two Sicilies.	1210-1212. First war of Venice and Genoa.
	1213-1276. James I., the Conqueror in Aragon.	1213-1215. War with France; the English lose Vermandois and Valois.			
	1214-1217. Henry I., King in Castile.	1215. Insurrection of the barons. **Magna Charta** signed at Runnymede.			

MAGNA CHARTA BY KING JOHN, 843-1215 A. D.—Continued

Church	Scandinavia and Slavs	Eastern Empire	Saracens	China, Japan, India	A. D.
1073. *POPE GREGORY VII.* *Papacy attains great power.*					1075
	1077. Hungary: Ladislas I., the Saint. 1084. Bohemia erected into a kingdom by the Emperor Henry IV.		1076. Jerusalem captured by Turks. 1084. Seljuks in Asia Minor.		
1088. Pope Urban II.			1092. The Seljuk Empire falls apart into a number of smaller states. Iconium or Roum, Damascus, Aleppo, Kerman and Iran.		
1099. Pope Pascal II.	1100-1523. Denmark: Introduction of Feudal system to Independence of Sweden. 1100-1468. Norway: 1100-1448. Sweden.		1095-1270. **The First Crusade.** 1099. Foundation of of the Kingdom of Jerusalem. Godfrey of Bouillon, elected king by the army.		1100
1119. Pope Calixtus II.				1127. China: Kaou Tsung, Emperor.	1125
			1146. **The Second Crusade.** *The power of the crusaders declines.*		1150
1154. Pope Hadrian IV.					
1159. Pope Alexander III. 1170. The Waldenses.	1157. Denmark: Waldemar I., the Great.			1156. Japan: War between the families of *Gen* and *Hei*.	
	1177. Poland: Casimir the Just.	1185-1204. Dynasty of Angelus.	1171-1193. Saladin becomes Sultan of Egypt. Extends his dominions in Egypt, conquers Syria, Assyria, Mesopotamia and Arabia.	1186-1206. India: The Afghans of Ghor rule.	1175
			1189. **The Third Crusade.**		
1191. Pope Celestine III.					
1198. **Pope Innocent III.**			1193. Saladin dies; his dominions divided.		
Papal power attains its climax. It is supreme over secular power.	1202-1241. Denmark: Waldemar II., the Conqueror.	1204. New revolution. The Crusaders return, again take Constantinople. 1204-1261. Latin Empire.	1202. **The Fourth Crusade.**	1206. Genghis Khan becomes emperor of the Mongols.	1200
ST. FRANCIS OF ASSISI (1182-1226)					
1215. Fourth Lateran, and twelfth general council against the Albigenses and all heretics. The doctrines of transubstantiation and auricular confession established.	1217-1262. Norway: Haco IV.				

X. FROM THE SIGNING OF MAGNA CHARTA TO THE DIS

GREAT EVENTS OF PERIOD. 1200-1300: Hanse League established. Great conquests of of cities and trade—especially in Italy, where also literature and art, inspired by Dante and Invention of gunpowder. Mariner's compass comes into use in the West. 1400-1500: Turks Consolidation of France and Spain. End of Tartar rule in Russia. Invention of printing. "New World." End of the Middle Ages.

A. D.	Spain, Portugal	Britain	France	Holy Roman Italy and Church
		1216-1272. Henry III.		
	1217. Ferdinand, King of Castile.	1214-1292. *ROGER BACON.*		*Struggle of the Guelfs and Roman pontiffs is carried century.*
1225				
	1230. **Castile and Leon united by Ferdinand III., who takes large territory from the Moors.**	1228. **The Fifth Crusade.** Many English and French nobles join.	1226-1270. LOUIS IX., Saint. Blanche of Castile, his mother, regent.	1243. Struggle of Pope Innocent IV. with the Emperor Frederick.
1250	1253. The Alhambra founded.		1248. The king sets out on **The Sixth Crusade.**	1227-1274. *THOMAS AQUINAS.*
		1263-1265. CIVIL WAR.		
		1265. Parliament of Simon of Montfort. Beginning of the House of Commons. Defeat and death of Simon of Montfort at Evesham.		
		1270. **The Seventh and Last Crusade.**		
		1272-1307. EDWARD I., Longshanks.		
1275	1274. Crown of Navarre passes to France.		1276. France at war with Castile.	1274. Fourteenth General Council at Lyons.
		1283. England and Wales united. Robert Bruce and John Balliol contend for the crown of Scotland.		
		1284. Annexation of Wales to England.		
	1291. James II., King of Aragon.			1293. Naval war between Genoa and Venice.
		1297. War between England and Scotland.	1297. Invasion of Flanders.	
1300			1302. First convocation of the states-general in France.	1303. Papal power declines.
			1304. War with Flanders.	
		1306. ROBERT BRUCE proclaimed King of Scotland.		
				1309. Seat of the popes transferred to Avignon.
				1311. General Council at Vienna.
	1312. Alphonso XI., King of Castile and Leon.			1265-1321. *DANTE.*
1325				
	1327. Arrival of 200,000 Moors to assist Granada.	1327-1377. EDWARD III.		
		1328-1400. *CHAUCER.*	1328-1498. **The House of Valois.**	
			1328-1350. Philip VI.	

COVERY OF AMERICA BY COLUMBUS, 1215-1492 A. D.

Tartars in Asia; they overrun Russia and establish a dynasty at Moscow. 1300-1400: Growth Giotto, make progress. Popes at Avignon. Era of Wyclif: his teaching spreads in Bohemia. take Constantinople. Revival of learning and advance of art in the West—especially in Italy. Formation of modern "middle classes." Maritime discoveries: The cape route to India; the

Empire Germany	Switzerland, Poland, Hungary, Bohemia	Scandinavia and Russia	Eastern Empire	Saracens	China, Japan, India	A. D.
Ghibelines. The power of the to the highest pitch during this						
					1219. Japan: The shogunate seized by the Fujiwara.	
		1224-1240. Mongolian invasion of Russia.	1221. Robert Guiscard, Emperor.		1221. The Khorasmian Empire overthrown by Genghis Khan.	**1225**
1243. **The Hanseatic League.**						
1250. **Conrad IV.**, Emperor.			1244. The Khorasmians take Jerusalem.	1250. Egypt: The Mamelukes rule; take Damascus and Aleppo.		**1250**
		1242. Alexander Nevski, Prince of Novgorod.		1258. Hulaku Khan enters Persia, takes Bagdad, and end to the caliphate.	1259-1294. China: Kublai Khan. Emperor of all China, founder of the Mongol dynasty.	
		1262. Norway: Iceland subjected. Greenland tributary to Norway.	1261. Michael Palæologus recovers Constantinople and overthrows the Latin Empire.		1264. China: Kublai Khan builds Pekin, and makes it his capital.	
House of Hapsburg 1273. **Rudolf,** Emperor, founds House of Hapsburg.						**1275**
		1279. Russia: Hanseatic settlement at Novogorod.			1281. Japan: Invasion of Mongol Taters.	
			1291. Capture of Acre by the Mamelukes; end of the European states in Asia Minor.	1288. Othman begins to lay the foundations of the Turkish power in Asia Minor.		
1298. **Adolphus**, Emperor, deposed and Albert I. enthroned. 1304. Rise of the Swiss towns. 1306. Rudolf of Austria, Emperor. 1308. Henry of Luxemburg, Emperor. General insurrection in Switzerland.	1295. Poland: Vladislav the Dwarf, founder of Polish greatness.					**1300**
1314. Louis of Bavaria and Frederick of Austria contend for the crown. 1322. Frederick of Austria defeated.	1315-1388. AUSTRO-SWISS WAR.			1326. Death of Othman; Orkhan, son of Othman, makes Prusa his capital. 1327. Nicomedia taken by Orkhan.		**1325**
		1328. Moscow under the Grand-duke Ivan Kalita becomes paramount in Russia.	1329. Andronicus III. defeated by the Turks in the battle of Pelekanon. 1330. Nicæa taken.			

X. FROM THE SIGNING OF MAGNA CHARTA TO THE DISCOV

A. D.	Spain, Portugal	Britain	France	Holy Roman Italy and Church
		1337. Edward lays claim to France which gives rise to: 1337-1453. HUNDRED YEARS WAR.		
	1340. Moors defeated at Tarifa.			1339. Struggle in Rome between the Colonna and the Ursini.
1350	Heroic Age of Portugal.			1347. Democracy in Rome under Rienzi, last of the Tribunes. 1354. Rienzi killed; papal dominion restored.
			1364-1380. Charles V., the Wise.	1265-1337. *GIOTTO.*
1375				
	1394-1460. **Henry the Navigator,** King of Portugal.	1399-1461. **House of Lancaster.** 1399. Henry IV., King of England.		
1400				
	1407. John II., King of Castile.	1406. James I., King of Scotland.	1410. Civil war between Orleans and Burgundy.	
	1416. Alphonso V., King of Aragon and Sicily.	1414. Henry V. claims the French crown.		1414. Council of Constance.
		1422. Henry VI. proclaimed at Paris, King of France. War with France.		
1425			1427-1429. **Siege of Orleans.** The English defeated by the French under Joan of Arc. France saved from the fate of Ireland. Charles VII. crowned at Rheims.	1429-1463. Cosmo de' Medici in Florence, great patron of the arts and sciences.
	1430. War between Castile and Granada.	1444. Truce with France. Marriage of Henry to Margaret of Anjou.	1431. Joan of Arc burned.	

ERY OF AMERICA BY COLUMBUS, 1215-1492 A. D.—Continued

Empire Germany	Switzerland, Poland, Hungary, Bohemia	Scandinavia and Russia	Eastern Empire	Saracens	China, Japan, India	A. D.
	1333. Poland: Casimir the Great becomes King.				1333. China: Shun-te last of the Mongol Emperors succeeds. Japan: Fall of the Hojo family. 1336-1392. Japan: Fuedalism reached its height.	
		1340. Denmark: Waldemar III.	1341. John V. (Paleologus), Emperor.			
House of Luxemburg 1346-1378. Charles IV., King of Bohemia.	1342. Hungary: Louis the Great.					**1350**
1355-1356. Promulgation of the golden bull; it fixes the prerogatives of the electoral college. Fundamental law of the empire.			1354. Turks seize Gallipoli in Europe.	1359. Murad I., conquered Adrianople. 1365. Adrianople residence of sovereigns.	1363. Timur or Tamerlane, begins his career of conquest. 1368-1398. China: Hung Woo establishes the native Ming dynasty.	
1378. Wenceslas, King of Bohemia, Emperor.	1370. Poland: Extinction of the royal race of Piasts with Casimir III.	1382. Russia: The Tartars sack Moscow. 1387. Denmark and Norway: Margaret, the Semiramis of the North, becomes queen. 1397. **Union of Calmar,** forming Denmark, Sweden and Norway into a single monarchy.	1381. The empire pays tribute to the Turks.		1369. Timur becomes king of Transoxiana and makes Samarcand the capital of his new empire. 1392. Timur subjugates Persia. 1398. Invasion of India by Timur; he takes Delhi.	**1375**
1400. Robert, Count of Palatine, Emperor.				1402. Bajazet defeated and made prisoner by Timur at the battle of Angora. 1403. Empire of the Turks divided after death of Bajazet, among Solyman I., Musa and Mohammed I. 1413. Mohammed I. sole ruler of the Turks.	1400-1573. Japan: The Shoguns dominate for almost two centuries.	**1400**
1411. Sigismund, King of Hungary, Emperor.						
	1419. Bohemia: HUSSITE WAR.					
1420. Sigismund becomes king of Bohemia.						
	1424. Bohemia: Death of John Ziska, the Hussite leader.					**1425**

X. FROM THE SIGNING OF MAGNA CHARTA TO THE DISCOV

A. D.	Spain, Portugal	Britain	France	Holy Roman Italy and Church
1450	1450-1560. **Period of great maritime power of the Portuguese.** 1452. Civil war in Navarre, in which Castile and Aragon join. 1454. Henry IV. of Castile, King of Spain.	1450. Richard, Duke of York, claims the throne. 1453. *End of the French and English wars. without any formal peace.* 1455-1485. WARS OF THE ROSES.		1450-1466. House of Sforza in Milan. 1454. Struggle between Cosmo de'Medici and the aristocracy.
		1461-1485. **House of York.** 1461. Edward IV., King. House of York.	1461. Louis XI., King.	
	1469. Marriage of Ferdinand of Aragon with Isabella of Castile.	1470. Henry VI. restored by Warwick. 1471. Return of Edward IV. Deaths of Warwick and Henry VI.		1469. **Lorenzo de' Medici** at Florence. 1471. Increase of the power of the Medici. Rise of learning. Sixtus IV., Pope.
1475	1479. **Union of Castile and Aragon.** 1492. Conquest of Granada and union of the kingdom with Castile. 1492. **America discovered by Columbus.**	1475. Edward IV. invades France. 1480. War between England and Scotland. **House of Tudor** 1485-1509. Henry VII.	1477. Artois and Burgundy united to France. 1483-1498. Charles VIII.	

XI. FROM THE DISCOVERY OF AMERICA BY COLUMBUS

GREAT EVENTS OF PERIOD. 1500-1600: The Reformation. Immense development of new archy strong in England. 1600-1700: The Thirty Years' War, at first a life struggle of Roman reached its zenith under Louis XIV.

A. D.	Britain	Spain and Portugal	Holland	France
		The power of Spain grew rapidly. Greatest power in Europe during most of Sixteenth Century. 1492. America discovered by COLUMBUS. 1494-1529. WARS WITH FRENCH for control of Italy. 1497-1503. Voyages of AMERIGO VESPUCIUS. South American coast explored. 1498. Vasco de Gama reaches India via Cape of Good Hope.		1491. Bretagne united to the crown. 1494-1529. WARS FOR THE CONTROL OF ITALY between the French and Spanish.
1500	1502. Marriage of Henry's eldest daughter, Margaret, with James IV., King of Scotland.			
	1509. HENRY VIII., King. 1512. War with France. Alliance with Spain and the Pope against France.	1506. Columbus dies at Valladolid.	1506-1530. **Margaret of Austria regent for her nephew Charles.**	1510. Council of Tours.

ERY OF AMERICA BY COLUMBUS, 1215-1492 A. D.—Continued

Empire Germany	Switzerland, Poland, Hungary, Bohemia	Scandinavia and Russia	Eastern Empire	Saracens	China, Japan, India	A. D.
1438. **House of Austria.** Albert II. (King of Bohemia and Hungary), Emperor. 1446. War with Hungary.			1438-1439. The emperor visits Italy to obtain help against the Turks.			
		1448. Denmark: Christian I., of Oldenburg, King. Sweden: Charles VIII.	1448. Constantine XII., last of the Greek Emperors.	1451. Mohammed II., sultan of the Turks.		**1450**
1453. Austria made an hereditary duchy by Emperor Frederick III.			1453. Siege and capture of Constantinople by the Turks, ending the Eastern Empire.			
			Ottoman Empire			
	1458. Hungary: Matthias Corvinus makes his country formidable to her neighbors.		1458. Greece subjected to the Turks.			
1462. The emperor besieged in court at Vienna.			1464. War with Hungary.			
1469-1480. Invasion of the Turks.			1468. Uzun Hasan, master of all Persia. 1470. Forms an alliance with the Venetians and the Duke of Burgundy against the Turks; conquers Bagdad.		1469. India: The Sikhs become powerful.	
		1472. Russia: Ivan III marries Sophia, niece of the Greek Emperor.				
1477. Marriage of Maximilian and Maria of Burgundy.	1477. Hungary: War with Frederick III.		1480. Otranto taken. 1481. Bajazet II., Sultan.			**1475**
	1485. Hungary: Matthias Corvinus takes Vienna.					

TO THE PEACE OF WESTPHALIA, 1492-1648 A. D.

life in Europe. Age of Charles V. Power of Spain, and her conquests in America. The mon-
Catholics and Protestants, results in downfall of Spain, and the ascendency of France, which

Holy Roman Empire		Poland, Prussia Hungary, Bohemia	Scandinavia and Russia	Ottoman Empire and Persia	China, Japan, India	A. D.
Italy and Church	Germany and Austria					
	1493-1519. MAXIMILIAN I.					
1494. Expedition of Charles VIII. into Italy. 1494-1559. **Sixty-five years of Italian Wars.**	1495. Diet at Worms.					
	COPERNICUS (1473-1543).					
1500. Partition of Naples between France and Spain. 1503. Naples annexed to the Spanish crown. JULIUS II., Pope.			1502. Destruction of the Golden Horde and end of Mongol power in Russia.	1502. Persia: Ismail Shah Sufi makes himself sole sovereign of Persia. 1505. War with Persia.		**1500**
		1506. Poland: Sigismund I., the Great.			1506. China: Portuguese, first Europeans in China.	
	1512. Maximilian divides the empire into ten circles.			1512. Selim I. dethrones and puts to death his father.		

XI. FROM THE DISCOVERY OF AMERICA BY COLUMBUS

A. D.	Britain	Spain and Portugal	Holland	France
	1513. Battle of Flodden; James IV. killed. 1515. WOLSEY, chancellor and cardinal.			1515. FRANCIS I. invades Italy.
		1516-1556. CHARLES I. of Spain and V of Germany. 1519. Conquest of Mexico by Cortez.		
				1521. First war with Charles V.
1525				1525. Frances defeated and taken prisoner at Pavia. 1527. Second war with Charles V.
	1529. **Reformation begins in England.**	*Rivalry of Spain and France begins.*		*CALVIN* (1509-1564).
	1532. The king marries Anne Boleyn. 1535. Henry excommunicated by the Pope. 1543. Invasion of France.	1531-1532. Conquest of Peru by PIZARRO. *IGNATIUS LOYOLA* (1491-1556) 1540. Lisbon the market of the world.		1532-1544. Struggle for possession of Italy.
1550	1547. Edward VI., King. Formal establishment of Protestantism. 1553. MARY TUDOR, Queen of England. 1554. Lady Jane Grey executed. 1555. Persecution of the Protestants. 1558. ELIZABETH, Queen. Rise of the Puritans. 1566. MARY, QUEEN OF SCOTS, takes refuge in England. *SPENSER* (1553-1599). *SIR WALTER RALEIGH* (1552-1618)	1541. De Soto discovers the Mississippi River. 1556. PHILIP II., King. *CAMOENS* (1525-1579). 1564. Acquisition of the Philippines. 1567. DUKE OF ALVA, Governor of the Netherlands. 1571. Battle of Lepanto.	WAR OF LIBERATION. 1568-1648. Sanguinary tribunals. Egmont and Horn beheaded, 1568. *Reign of Terror under Alva.*	1547. Henry II., King; CATHERINE DE' MEDICI, Queen. 1552. Fifth war with Charles V. *PALISSY* (1510-1589). RELIGIOUS WARS IN FRANCE 1562-1598. 1562. Religious liberty granted to the Huguenots. *MONTAIGNE* (1533-1592) 1572. Massacre of St. Bartholomew.
1575	1584. Raleigh's colony in Virginia. 1585. War with Spain. 1588. Spanish Armada destroyed. **Maritime supremacy of England begins.** 1596-1597. Naval expeditions of Drake and Raleigh in South America. Cadiz taken, and the Spanish fleet burned. *SHAKESPEARE* (1564-1616).	1580. Portugal passes under Spanish dominion. 1588. Defeat of the **Spanish Armada.** England saved from Spanish invasion. *CERVANTES* (1547-1616). 1598-1621. Philip III.	1579. Commencement of the Dutch Republic by the Union of Utrecht; WILLIAM, PRINCE OF ORANGE, stadholder. 1584. William of Orange assassinated.	1576. The Catholic league. 1577. Sixth religious war. 1588. Revolt of Paris. 1589-1792. **House of Bourbon.** 1589-1610. HENRY IV. 1590. Siege of Paris raised by the Spaniards. 1598. **Edict of Nantes** toleration granted to the Protestants.

TO THE PEACE OF WESTPHALIA, 1492-1648 A. D.—Continued

Holy Roman Empire						
Italy and Church	**Germany and Austria**	**Poland, Prussia Hungary, Bohemia**	**Scandinavia and Russia**	**Ottoman Empire and Persia**	**China, Japan, India**	**A. D.**
1513. Pope LEO X. patron of literature and the arts. *ARIOSTO* (1474-1533) *RAPHAEL* (1483-1520)	*LUTHER* (1483-1546) 1517. **Beginning of the Reformation.** 1519-1556. CHARLES V., King of Spain, Emperor. 1521. Accession of Bohemia and Hungary to the House of Hapsburg.		1520. Christian II. of Denmark invades Sweden and overthrows Sten Sture.	1514. Persians defeated; Kurdistan added to the empire. 1516. Cairo taken. 1520. Soliman the Magnificent, Sultan. 1521. Belgrade taken.		
1525. Spanish asdency by the victory of Pavia. *MICHAELANGELO* (1475-1564). *TITIAN* (1477-1576)	*HOLBEIN* (1498-1559)	1525. Albert, Grand-master of Teutonic Order makes East Prussia a secular possession.	1523. Sweden: Revolt under GUSTAVUS VASA. The Danes expelled. Union of Calmar dissolved. Denmark and Norway: Frederick I. 1530. Russia: IVAN IV., the Terrible.	1526. Invasion of Hungary. 1529. Invasion of Austria. Siege of Vienna.	1526. India: Baber founds the Mogul dynasty at Delhi.	**1525**
1540. Order of Jesuits founded by LOYOLA. 1545. Council of Trent.	1543. Alliance with England against France. 1546-1547. SCHMALKALDIC WAR.		1533. Norway and Denmark: Christian III.	1535. Barbarossa seizes Tunis.		
1550. Julius III., Pope.	1551. Treaty of Passau secures religious liberty to the Protestants.			1547. Turks invade Persia. 1551. Tripoli taken. 1552. Invasion of Hungary.		**1550**
1559. Termination of French wars in Italy. *Tintoretto* (1512-1594)	1556. **Charles V. abdicates.** 1564. MAXIMILIAN II., Emperor.		1559. Denmark and Norway: Frederick II. *Tycho Brahe* (1546-1601)	1559. Military power of the Turks at its greatest height under Soliman.	1556. India: AKBAR becomes Mogul emperor a patron of science and literature. *Mogul Empire at its greatest splendor.*	
1569. Florence a grand duchy. *Torquato Tasso* (1544-1595)		1569. Poland and Lithuania united by the Diet of Lublin.	1571. Russia devastated by the Tartars, and Moscow burned.	1570. War with Venice. 1571. Battle of Lepanto.	1573. Japan: Fall of the Ashikaga shoguns; Nobunaga supreme.	**1575**
	1576. Rudolph II., (King of Bohemia and Hungary) Emperor.	1575. Poland: Stephen Bathori chosen king; he strengthens the Jesuits. 1578. Alliance of Sweden and Poland against Russia.				
1585. Pope SIXTUS V. restores the Vatican library.		1587. Poland: Sigismund III., King.	1588. Denmark: Christian IV.	1589. Revolt of the Janizaries.		
1592. The Rialto and Piazza di San Marco built at Venice. *GALILEO* (1564-1642)	1594. Union of Protestants at Heilbronn. *KEPLER* (1571-1630)	*RUBENS* (1577-1640)	1592. Sweden: Sigismund III., of Poland, succeeds to the Swedish crown.	1595. Power in Hungary declines; revolt of Wallachia.		

XI. FROM THE DISCOVERY OF AMERICA BY COLUMBUS

A. D.	Britain	Spain and Portugal	Holland	France
1600	1603. UNION OF ENGLAND AND SCOTLAND. *BACON* (1561-1626). 1607. English settlement at **Jamestown.**	1609. Expulsion of the Moors.	1583-1645. *GROTIUS.*	1610. Assassination of Henry IV. 1614. Last assembly of the states-general.
	1618-1648. THIRTY YEARS WAR—THIRTY YEARS WAR—THIRTY YEARS WAR—THIRTY YEA			
1625	1620. Emigration of Pilgrims to New England and founding of **Plymouth.** *HARVEY* (1578-1657). 1625. Charles I., King. 1632. Maryland settled by a colony sent out by Lord Baltimore. 1642-1649. CIVIL WAR AND REVOLUTION. 1648. Cromwell routs the Scotch. The presbyterians expelled from parliament, which receives the name of "the Rump."	1621. Dutch War. 1625. Naval war with England. 1640. Portugal regains independence. *VELASQUEZ* (1599-1660)	1621. Dutch West India Company incorporated. 1625. Breda taken by Spinola. 1639. Great naval victory by Van Tromp, over the Spanish fleet in the Downs. *Vandyck* (1599-1641).	1624. Ministry of Cardinal Richelieu. *DESCARTES* (1596-1650). 1638. Invasion of Spain. 1640. Turin taken by the French. 1643. LOUIS XIV., King. 1648. WARS OF THE FRONDE.

XII. FROM THE PEACE OF WESTPHALIA TO THE CLOSE

GREAT EVENTS OF PERIOD. 1600-1700: Civil and religious liberty fought out in England of the British Empire. Government in England now and henceforth carried on by a Cabinet advance in arts and sciences. INDEPENDENCE OF THE UNITED STATES. THE for the next hundred years.

A. D.	United States	Britain	Spain and Portugal	France	Italy and Church	Holland
1650		1649. Trial and execution of Charles I. **The Commonwealth.** 1652. War with Holland. 1653. CROMWELL, Lord Protector. *MILTON* (1608-1674.)	1654. Brazil recovered from the Dutch. 1655. War with England.	1649. Siege of Paris. 1653. Mazarin enters Paris in triumph. *MOLIERE*(1622-1673)		1653. JOHN DE WITT, Grand Pensionary of Holland. *REMBRANDT* (1607-1669)

TO THE PEACE OF WESTPHALIA, 1492-1648 A. D.—Continued

Holy Roman Empire						
Italy and Church	**Germany and Austria**	**Poland, Prussia Hungary, Bohemia**	**Scandinavia and Russia**	**Ottoman Empire and Persia**	**China, Japan, India**	**A. D.**
					1603. Japan: Tokugawa Iyeyasu makes himself shogun; his descendants retain power till 1868.	**1600**
1609. Leghorn becomes the emporium of the Levant trade.	1608. Protestant union under Frederick the Elector.		1611. Sweden: GUSTAVUS ADOLPHUS, King. War with Denmark. OXENSTIERN, Minister. 1613. Russia: MICHAEL ROMANOFF, Czar, founder of the present ruling line. 1616. *Sweden dominates the North.*		1605. India: Jehangir, Mogul, Emperor.	
RS WAR—THIRTY YEARS WAR—THIRTY YEARS WAR. 1618-1648						
	1620. Massacre of Prague.					
1626. **St. Peter's** dedicated.	1628. Victories of Wallenstein.					**1625**
1631. Influence of France increases.	1629. Gustavus Adolphus lands in Germany. 1632. Battle of Lutzen.	1632. War with Russia. Poles advance to Moscow. 1640. FREDERICK WILLIAM of Prussia.	1632. Sweden: CHRISTINA, Queen; OXENSTIERN, Regent.	WAR WITH AUSTRIA 1682-1699. 1634. Murad invades Persia. 1637. Troubles on the Tartar frontier. Bagdad taken by the Turks.		
1646. Revolt of Naples under Masaniello.	1648. PEACE OF WESTPHALIA, THE BASIS OF ALL SUBSEQUENT TREATIES; SIGNED AT MUNSTER. *At this time begins the policy of the "Balance of Power" in Europe.*			1645. War with Venice.	1644. China: Establishment of the Manchu dynasty.	

OF AMERICAN WAR OF INDEPENDENCE, 1648-1783 A. D.

under the Stuarts. Rise of modern science and philosophy. 1700-1800: Astounding growth
Ministry. Development of manufactures in England. Inventions and discoveries. Immense
FRENCH REVOLUTION which powerfully influences social, political and intellectual progress

Scandinavia	**Germany**	**Prussia and Poland**	**Russia**	**Ottomans, India, Japan, China**	**A. D.**
		1648. Poland: The Cossacks revolt and defeat the Poles. John Casimir, King.			**1650**
1653. Sweden: Christina resigns. Charles X. first of the House of Zweibrucken. 1655. Charles X. of Sweden invades Poland.		1653. Poland: War with Russia.	1654. Russian victories in Poland.		

XII. FROM THE PEACE OF WESTPHALIA TO THE CLOSE OF

A. D.	United States	Britain	Spain and Portugal	France	Italy and Church	Holland
		Stuarts restored.		1659. Peace of the Pyrenees.		
		1660. Charles II., King.	1661. Invasion of Portugal.			
	1663. Settlement of North Carolina under royal patent.					
	1664. New Amsterdam occupied by the English.		1665-1700. CHARLES II.	1667-1697. First three wars of Louis XIV.		1667. Holland: Peace of Breda: loss of New Netherlands.
		1668. Triple alliance of England, Sweden and Holland against France.	*MURILLO* (1618-1682)	1667. War with Spain.	1669. Candia taken from Venice.	
					1670. War between Genoa and Savoy.	*SPINOZA* (1632-1677)
				1672. War with Holland.		1672. Sea fight between the Dutch fleet, under De Witt and De Ruyter, and the English and French fleets; Dutch defeated.
			1673. War with France to protect Holland.			
1675	1675-1676. King Philip's War in New England. Bacon's Rebellion in Virginia.				1676. Messina blockaded by the Dutch and Spanish fleets.	Holland: William III., Stadtholder.
		1679. HABEAS CORPUS ACT passed.		1678. Peace with Holland and Spain restores tranquility to Europe.		
				1680. **France the most formidable power in Europe.**		
		NEWTON (1642-1727) 1685. James II., King. Rise of the Whigs and Tories.		1685. Revocation of the edict of Nantes.		
		JOHN LOCKE (1632-1704)				
		1688. Revolution.		1688. War of the allies against France.		
	1689-1697. WAR OF WILLIAM AND MARY WITH THE FRENCH.	1689. WILLIAM III., King, and MARY II., Queen. War with France.	1689. Revolt in Catalonia in favor of France.		1689. Alexander VIII., Pope.	
		1690. Battle of the Boyne. James defeated, returns to France.	1691. Incursion of the French into Aragon.			
					1693. Battle of Marsaglia.	1695. Brussels bombarded by the French.
		1697. General peace.		1697. General peace of Ryswick between France and the allies.		
1700		1701-1714. WAR OF THE SPANISH SUCCESSION — WAR OF THE SPANISH				
	1702-1713. QUEEN ANNE'S WAR WITH THE FRENCH.	1702 QUEEN ANNE War against France and Spain.	1701. Philip V., King.	1702. Invasion of Holland. Revolt of the Huguenots.	1702. French victory at Luzzara over the Imperialists.	
		1704. Gibraltar taken by English.	1705. Barcelona taken by the Allies.	1704. Defeat at Blenheim.	1706. French driven from Italy by Prince Eugene.	

AMERICAN WAR OF INDEPENDENCE, 1648-1783 A. D.—Continued

Scandinavia	Germany	Prussia and Poland	Russia	Ottomans, India, Japan, China	A. D.
		1656. The Elector of Brandenburg allies himself with Sweden against Poland.			
1658. Denmark: War against the Swedes, who overrun Denmark, and menace Copenhagen.	1657. Leopold I., Emperor.	1657. Poland cedes Prussia to the Elector.		1657. Alliance with Sweden against Poland.	
1660. Denmark: Peace of Copenhagen. Revolution in Denmark; absolute monarchy established. Prussia acknowledged independent.				1661. War with Austria. 1662. Invasion of Hungary.	
	1665. Tyrol united to Austria.			1664. India: Rise of the Mahratta power. Sivaji takes and sacks Surat.	
	1672. The Emperor and Elector of Brandenburg ally themselves with Holland against France.		1671. The Cossacks subjugated.	1672. Invasion of Poland.	
	1673. War of Austria and France.	1674. Sobieski, King of Poland.			
1675. The Swedes invade Brandenburg and are defeated at Fehrbellin.	1676. General revolt of the Hungarians.				**1675**
1677. Battle of the Lund, between the Swedes and Danes; the latter defeated.	*LEIBNITZ* (1646-1716)			1678. First war with Russia.	
	1680. Greater part of Alsace seized by France. 1683. Siege of Vienna by the Turks.		1682. Ivan and Peter, Czars.	1682. War with Austria.	
	1686. Buda taken after being held by the Turks one hundred and forty-five years.			1686. Russia declares war. 1686. India: The Dekkan conquered by Aurungzeb.	
	1687. Joseph I., King of Hungary.	1688. Prussia: Frederick III.		1687. Revolution in Constantinople. Solyman II., Sultan.	
			1689. Russia: PETER THE GREAT begins personal rule after overthrowing his sister Sophia and repressing the Streltsi.	1689. First trade with China. India: Height of the Mogul power under Aurungzeb. China: Great influence of Jesuits.	
	1690. Joseph I. elected King of the Romans				
1693. The King of Sweden declared absolute.			1692. First trade with China.		
		1696. Poland: Death of Sobieski; succeeded by:			
1699. CHARLES XII. begins to reign. Denmark, Poland and Russia form an alliance against Sweden.	1697. Victories of PRINCE EUGENE over the Sultan Mustapha at Zenta.	1697. Frederick Augustus I.		1699. **Peace of Carlowitz. The Ottoman power broken.**	
SUCCESSION 1701-1714	1700-1721. GREAT NORTHERN WARS.				**1700**
1702-1706. Charles XII. sweeps Poland and Russia.	1701. Hague alliance.	1701. Prussia is erected into a kingdom under Frederick I.	1700. Peter the Great wars with the Northern Powers. 1703. St. Petersburg founded.	1703. Mustapha II. deposed by the Janizaries.	
	1704. Battle of **Blenheim.** Bavarians and French defeated by English and Allies. Germany delivered from Louis XIV.	1704. Stanislaus I., King of Poland.			

XII. FROM THE PEACE OF WESTPHALIA TO THE CLOSE OF

A. D.	United States	Britain	Spain and Portugal	France	Italy and Church	Holland
	1707. Unsuccessful expedition against Port Royal.	1707. Act of Union of England and Scotland. First united parliament of Great Britain meets.			1707. All Spanish possessions in Italy abandoned.	
	1713. Treaty of Utrecht which gives Arcadia to the English.	1713. **Peace of Utrecht.** England aquires large American possessions.		1713. Peace of Utrecht; perpetual separation of the crown of France and Spain. 1715. Death of Louis XIV.; Louis XV., King. *MONTESQUIEU* (1689-1755)	1715. Siege of Corfu raised.	1715. Treaty of Antwerp with Austria.
	1718. New Orleans settled by the French.	1718. War with Spain. Quadruple Alliance of the Emperor, France, England and				
				VOLTAIRE (1694-1778)	1719. Sicily invaded by the Spanish.	
1725		1727. George II., King of England.	1724. Spain: Philip V. abdicates but resumes power after some months.	1724-1725. Congress of Cambray to consider claims of Spain and Austria.		
	1729. The Carolinas separated.			1733. The Polish succession involves France in war.	1730. Clement XII., Pope.	
	1734. Beginning of the Great Awakening in New England.	1739. War with Spain.	1734. Conquest of Sicily and Naples by Don Carlos.			
		1740-1748. WAR OF THE AUSTRIAN SUCCESSION — WAR OF THE AUSTRIAN				
		1745. Troubles in Scotland.		1744. War with England and Austria. *D'Alembert* (1717-1783)	1744. Italy invaded by the French and Spaniards.	
		HUME (1711-1776).	1746. Ferdinand VI., King.	1747. War with Holland.	1746. French and Spaniards driven from Lombardy.	1747. Netherlands: William IV., Stadtholder.
1750						1751. Netherlands: William V., Stadtholder.
	1754-1763. OLD	FRENCH AND INDIAN WAR OR SEVEN YEARS WAR: ENGLAND AND				
	1759. Invasion of Canada; death of Wolfe. Quebec taken.	1756. Alliance with Prussia. 1760-1820. George III. 1762. War with Spain. 1763. Peace of Paris.		1760. Loss of all Canada. 1763. Peace of Paris.		
	FRANKLIN (1706-1790) 1765. Stamp Act resisted in Massachusetts and Virginia.	*GIBBON* (1737-1794). 1765. Establishment of a British Empire in India.	1767. Jesuits expelled from Spain.			
		JAMES WATT (1736-1819)		1770. Marriage of the dauphin to Marie Antoinette.	1773. Jesuits expelled from Rome.	

AMERICAN WAR OF INDEPENDENCE, 1648-1783 A. D.—Continued

Scandinavia	Germany	Prussia and Poland	Russia	Ottomans, India, Japan, China	A. D.
			1707. Revolt of the Cossack Mazeppa. 1708. Charles XII. of Sweden invades Russia.		
	1711. CHARLES VI., Emperor.	1712-1786. FREDERICK II.	1709. Is defeated at **Pultowa** by Peter the Great. Russia becomes a great power. 1714. Finland conquered.		
1715. Charles returns to Sweden. Prussia and England join the alliance against him.					
HOLLAND, AGAINST THE				1717. Turks lose Belgrade.	
1718. Charles XII. invades Norway and is killed at the siege of Frederickshall.	*BACH* (1685-1754).				
1720. Sweden: The queen abdicates in favor of her husband, Frederick I.	*HANDEL* (1685-1759).		1721. Peter assumes the title "Emperor of all the Russias."	1723. Turks and Russians attempt to dismember Persia.	**1725**
LINNAEUS(1707-1778)	1725. Treaty of Vienna, alliance between Spain and Austria.		1727. Treaty with China.		
1730. Denmark: Christian VI.	1733. **War of the Polish succession.**	1733. Poland: Frederick Augustus II. The diet elects Stanilaus, but is compelled by the Russian army to elect Frederick.	1730. Peter II., last of the Romanoffs.		
		1734. Stanislaus besieged in Dantzic, escapes to Konigsberg.		1734. Turks driven from Persia by Nâdir Shah. 1739. India: Invaded by Nâdir Shah who takes and plunders Delhi.	
SUCCESSION 1740-1748 1741. Sweden: War with Russia. Swedes driven out of Finland. 1743. Peace of Abo with Sweden gives to Russia southern Finland.	1741. MARIA THERESA succeeds to the hereditary states. 1745. Francis I., husband of Maria Theresa, Emperor.	1740-1786. FREDERICK THE GREAT of Prussia.		1740. Renewed invasion of Turkey.	
					1750
PRUSSIA VS. FRANCE, AUSTRIA, RUSSIA, SPAIN AND SWEDEN. 1756-1763					
				1756. India: Calcutta taken by Surajah Dowlah of Bengal; the Black Hole.	
	1763. Prussia and Austria hold the balance of power on the Continent.		1762. CATHERINE II. reigns.		
	LESSING (1729-1781).	1764. Poland: Stanislaus Poniatowski elected king.			
1766. Denmark: Christian VII.					
			1768. War with the Ottoman Empire.	1678. War between Russia and the Ottoman Empire.	
1772. Despotism re-established in Sweden by Gustavus III.	1772. JOSEPH II. takes part in the first partition of Poland, the territory acquired being made into the Kingdom of Galicia.	1772. First partition of Poland, among Russia, Prussia and Austria.		1773. Ottoman Empire: The Russians are repulsed at Varna and Silistria. ABDUL HAMID succeeds.	

XII. FROM THE PEACE OF WESTPHALIA TO THE CLOSE OF

A. D.	United States	Britain	Spain and Portugal	France	Italy and Church	Holland
				1774. LOUIS XVI., King.		
1775	1775-1783. AMERICAN REVOLUTIONARY WAR.					
	1775. April 19, skirmish at Lexington. June 17, battle of Bunker Hill.	1775. Lord North's "conciliatory measures" rejected by the colonies.				
	1776. **Declaration of Independence, July 4.** British army takes possession of New York. Hessians hired for service in America.	*ARKWRIGHT* (1732-1792)		1776. Franklin in Paris.		
	1777. Battle of **Saratoga** and critical battle of the Revolution.	1778. Siege and capture of Pondicherry, by the English.	1777. Portugal: Maria, Queen.	1778. Alliance with America.		
	1781. Surrender of Cornwallis at Yorktown.	1783. Treaty of Versailles. Independence of the United States acknowledged.	1779. Spain: Alliance with the American colonists.	1780. Rochambeau sent to aid the Americans. *LAVOISIER* (1743-1794)		
	1783. Peace of Versailles between France, Spain, England and America.					

XIII. FROM THE RECOGNITION OF AMERICAN INDEPENDENCE TO THE

GREAT EVENTS OF PERIOD. France chief power in Europe. Napoleon's colossal power
pean people. Continued rapid advancement of science, inventions and discoveries. Increased

A. D.	United States	Great Britain	Spain and Portugal	France	Italy and Church
		1787. Warren Hastings impeached.	1788. Charles IV., King.	1787. First assembly of Notables. Lafayette commander of the national guards.	
	1789. GEORGE WASHINGTON, President.			1789-1799. FRENCH REVOLUTION. 1792. War with Germany. France declared a republic. Battle of **Valmy.**	
	1793. Washington reelected. Neutrality in regard to France. *HAMILTON* 1757-1804.	1793. FIRST COALITION AGAINST FRANCE: *Sweden, Denmark and Turkey.*		DIRECTED BY ENGLAND, *which forms alliances* 1793. King and Queen beheaded. Reign of Terror.	
				1795. **The Directorate.** 1795. NAPOLEON BONAPARTE commands the army.	
	1797. John Adams, second president.	1797. NELSON destroys French fleet near Alexandria.	1796. Alliance with France; war against England.	1796. War in Italy. 1797. Napoleon in Austria.	1796-1797. Napoleon's Italian campaign.
		1798. SECOND COALITION AGAINST		FRANCE: *Alliances of* 1798. Expedition to Egypt. 1799. Swiss campaign.	*England with* 1798. Roman republic proclaimed by the French.
1800	1801. THOMAS JEFFERSON, third president.	1800. Union of England. *SIR WALTER SCOTT* (1771-1832)		1800. Battle of Marengo. *Madame de Stael* (1766-1817) 1802-1815. NAPOLEONIC WARS.	1802. Napoleon, President of the Italian Republic.
	1803. Purchase of Louisiana. *JOHN MARSHALL* 1755-1835.	1803. Successful war in India.	1803. Purchases neutrality with the French by a subsidiary treaty; declares war against England, 1804.	1804-1814. **First French Empire.** Napoleon I., Emperor of the French. *BICHAT* (1771-1802).	

AMERICAN WAR OF INDEPENDENCE, 1648-1783 A. D.—Continued

Scandinavia	Germany	Prussia and Poland	Russia	Ottomans, India, Japan, China	A. D.
	IMMANUEL KANT (1724-1804)		1774. Revolt of the Cossacks. Peace of Kutchuk-Kainarji between Russia and Turkey.	1774. India: Warren Hastings, first British governor-general.	**1775**
	1778. War of the Bavarian succession. Bavaria seized by Germany.			1778. India: War between the English and the Mahrattas.	
	MOZART (1756-1791).				
1780. *Declaration of the Armed Neutrality for the protection of neutral flags* against the right of maritime search claimed by England—joined by Denmar and Sweden. Prussia and Austria, 1711. Portugal, 1782.					

ESTABLISHMENT OF THE SECOND FRENCH REPUBLIC, 1783-1848 A. D.

and downfall. Fall of despotisms and rise of Republicanism; great political advance of Euro-philanthropic effort and intellectual enlightenment.

Scandinavia, Holland, Belgium, Switzerland	Germany	Prussia and Poland	Russia	Ottomans, China, India, Japan	A. D.
	SCHILLER (1759-1805)	1786. Prussia: Death of Frederick the Great. Frederick William II.	1787. War with the Turks.	1787. Disastrous war with Austria and Russia.	
1792. Sweden: Gustavus IV.	1792. War with France.				
with Russia, Sardinia, Spain, Naples, Prussia, Austria, Portugal and Tuscany; all Europe except					
	GOETHE (1749-1832).	1793. Second partition of Poland by Russia and Prussia. 1794. Polish revolt at Cracow. Revolt under Kosciuszko.			
1795. Holland conquered and the Batavian Republic proclaimed.		1795. Final partition of Poland; extinction of the kingdom.			
	1797. Napoleon's Austrian campaign. Peace of Campo Formio in which Austria cedes Belgium and Lombardy receiving Venetia.		1796. Unsuccessful war with Persia.		
Russia, Naples, Sicily, Turkey and Austria—Prussia, Holland and Belgium, neutral.					
1798. Swiss revolution. Helvetian Republic declared.		1798. Prussia: Frederick William III.		1798. War with the French in Egypt.	
1801. Danish fleet at Copenhagen defeated by Nelson.			1801. ALEXANDER I.		**1800**
	1803. **End of the Holy Roman Empire.** FRANCES II.			1803. Insurrection of Mamelukes at Cairo.	
	1804. The Emperor of Germany assumes the title of Emperor of Austria.		1804. War with Persia.	1803. India: Great Mahratta War.	

XIII. FROM THE RECOGNITION OF AMERICAN INDEPENDENCE TO THE ESTAB

A. D.	United States	Great Britain	Spain and Portugal	France	Italy and Church
				1804. Code Napoleon published.	
		1805. THIRD COALITION AGAINST FRANCE; *formed by England; alliances*			
		1805. Napoleon defeated at Trafalgar. *WORDSWORTH* (1770-1850)	1805. **Battle of Trafalgar.**	1805. May 26, Bonaparte crowned King of Italy, at Milan. Naval defeat at Trafalgar. Austrian campaign; battle of Austerlitz. Peace of Presburg. *CUVIER* (1769-1832).	1805. Napoleon crowned King of Italy.
		1806. FOURTH COALITION AGAINST FRANCE:			
	1806. British Orders in Council and Napoleon's decrees seriously impair American commerce.	1807. Bill for the abolition of the slave trade, passed.	1807. Invasion of Portugal. 1808. Madrid taken by the French. Joseph Bonaparte, King.	1806. *Formation of the Confederation of the Rhine.* Victories of Auerstadt and Jena over the Prussians. Berlin decree against British commerce.	1808. Rome annexed by Napoleon to the kingdom of Italy.
	1809. James Madison, fourth president.	1809. FIFTH COALITION AGAINST FRANCE: *England, Austria, Spain and Portugal.*			1809. Papal states annexed to France.
				1810. Continental peace except with Spain. 1810. Emperor marries Maria Louisa of Austria. 1811. Napoleon II., King of Rome, born.	
	1812-1814. WAR OF 1812, between United States and Great Britain.		1812. Battle of Salamanca.	1812. Disastrous war against Russia. The Poles declared a nation by Napoleon. Diet of Warsaw.	
		1813. SIXTH GREAT COALITION AGAINST FRANCE AND GENERAL INSURRECTION OF THE *after the Congress of Prague, with 800,000 men; against France, Italy, the Confederation of the Rhine*			
	1813. Perry's victory on Lake Erie.				
	1814. City of Washington burned by the British.		1814. Ferdinand VII., restored.	1814. Allies enter Paris. **House of Bourbon.**	1814. Fall of Napoleon. Kingdom ceases.
	1815. British defeated at New Orleans.	1815. WELLINGTON victorious at Waterloo. The Allies enter Paris, and Napoleon is banished to St. Helena.	1815. Union of Portugal and Brazil under John VI.	1815. Napoleon returns from Elba. **Hundred Days' war.** Abdication of Napoleon. TALLEYRAND (1754-1838).	1815. Kingdom of Two Sicilies restored.
	1816. U. S. Bank incorporated.	1816. Bombardment of Algiers. The Bey compelled to abolish slavery.			
	1817. JAMES MONROE, President. First passage of the Atlantic by steam effected by the Savannah, of New York, to Liverpool.		1817. Slave trade abolished.	1818. France joins in Holy Alliance.	
	1819. Florida purchase.	1820-1830. GEORGE IV.	1819. Ferdinand of Spain sells Florida to the United States.		
		1821-1829. WAR OF GRECIAN INDEPENDENCE.			GREEKS.
	1821. Monroe re-elected Missouri Compromise bill passed.			1821. Death of Napoleon at St. Helena.	1821. Austrian invasion of Italy.
	1824. Visit of Lafayette.	1823. The CANNING ministry.		1824. CHARLES X., King.	
1825	1825. Erie Canal opened. Protective tariff enacted. J. Q. Adams. President.	*GEORGE STEPHENSON* (1781-1848)			1825. Death of Ferdinand after reign of sixty-six years.
	DANIEL WEBSTER 1782-1852.				1827. Treaty between Russia and Turkey respecting Greece.
		1828. Wellington ministry. Irish disturbances.			

LISHMENT OF THE SECOND FRENCH REPUBLIC, 1783-1848 A. D.—Continued

Scandinavia, Holland, Belgium, Switzerland	Germany	Prussia and Poland	Russia	Ottomans, China, India, Japan	A. D.
	Confederation of the Rhine. Prussia henceforth the center of the German federate system. *HEGEL* (1770-1831).				
with Sweden, Russia and Austria—Prussia unfortunately neutral.	1805. Battle of Austerlitz.				
	NAPOLEON PROTECTOR OF THE CONFEDERATION OF THE RHINE.				
England, Russia, Prussia, Saxony and Sweden.					
1806. Louis Bonaparte, King of Holland.					
1808. Denmark: Frederick VI.	1807. Victories of Eylau and of Friedland are followed by the peace of Tilsit in which Prussia loses her Polish territories. *BEETHOVEN* (1770-1827).		1807. Treaty of Tilsit.	1807. War against Russia and England.	
1809. Sweden: Charles XIII.; Bernadotte becomes prince royal. 1810. Holland joined to France.	1809. Battles of Eckmühl, Aspern and Wagram. Peace of Vienna. Austria cedes territory to Russia, Bavaria and France. *A. VON HUMBOLDT* (1769-1859)				
		1812. The Poles declared a nation by Napoleon. Diet of Warsaw.	1812. Russian campaign. Invasion of Napoleon. Moscow burned.		
NATIONS OF EUROPE AGAINST FRENCH DOMINION: *England, Russia, Prussia, Sweden and Austria and Denmark, with about 400,000 men.*					
1814. Union of Holland and Belgium. 1814. **Union of Sweden and Norway** as two kingdoms under one monarch.	1813. War of German independence. Battle of Leipsic. Bonaparte driven to the Rhine.			1813. Servia invaded by Turkish army. 1914. Malta falls to England.	
1815. William I., King of the Netherlands. **Battle of Waterloo** and defeat of Napoleon.	1815. **Congress of Vienna effects the political reconstruction of Europe.** Germanic Confederation organized.		1815. Joins the "Holy Alliance": Russia, Prussia and Austria, later joined by France. Poland united to Russia.		
1818. Sweden: CHARLES XIV. (Bernadotte).	1817. Population 28,000,000. 1818. Napoleon's son made Duke of Reichstadt. METTERNICH (1773-1859).	1818. The **Zollverein** formed. 1819. Death of Marshal Blucher.	1819. Establishment of military colonies. Liberty of the press in Poland nullified.		
AIDED BY ENGLAND, RUSSIA, AND FRANCE VS. TURKS. 1821-1829					
		1821. Congress of monarchs at Laybach.		1822. Greek declaration of independence. Massacre of Scio and capture of Acropolis of Athens by patriots.	1825
			1826. NICHOLAS I. crowned at Moscow. War against Persia.	1826. Greece: Missolonghi and Athens (1827) taken by the Turks.	
			1828. Russia: War declared against Turkey. By the peace of Turkmantchai, Persian Armenia is acquired.		

XIII. FROM THE RECOGNITION OF AMERICAN INDEPENDENCE TO THE ESTAB

A. D.	United States	Great Britain	Spain and Portugal	France	Italy and Church
1825	1829. ANDREW JACKSON, President.	1830. William IV., King. Difficulties with China.	1830. Salic law abolished.	1830. Algiers taken by the French. Revolution and abdication of Charles X. Louis Philippe, King.	
	1831. Northeastern boundary between the United States and British provinces established.	1832. **Reform Bill** passed.		1831. Abolition of hereditary peerage in France.	1831-1833. Formation of Young Italy party by Mazzini.
	1833. President Jackson re-elected. Bank deposits removed from the U. S. Bank.		1833. Isabella II., Queen of Spain. Portugal a constitutional monarchy.		
			1836. Spain: The queen regent adopts the constitution of 1812.	1836. Insurrection attempted by Louis Napoleon at Strasburg.	
	1837. Independence of Texas acknowledged. Martin Van Buren, President.	1837. VICTORIA, Queen.	1837. The monasteries in Spain dissolved.		
	EMERSON 1803-1882.	1840. War with China over the opium trade. War in Syria: Great Britain an ally of Austria and Turkey.		*H. DE BALZAC* (1799-1850) GUIZOT (1832-1848).	
	1841. W. H. Harrison. President. Death of Harrison and succession of John Tyler.	1841. Chinese war ended.	1842. Insurrection in Barcelona.		1843. King Otho of Greece compelled to accept a constitution.
	MORSE 1791-1872.	*THOMAS CARLYLE* 1795-1884			
	1845. Texas annexed to the U. S. Treaty with China. James K. Polk, President.	1844. Daniel O'Connell's trial. Sentence reversed by the House of Lords.		1844. War with Morocco. **The Second Republic.**	
	1846-1848. WAR WITH MEXICO. The Oregon treaty with Great Britain, settling the northwestern boundary of the United States.	1846. Repeal of the English corn-laws. 1847. Severe famine in Ireland.	1846. Civil war in Portugal.	*VICTOR HUGO* 1802-1885.	
	1848. Treaty of Guadalupe Hidalgo, ends Mexican War. Gold discovered in California.	1848. Civil war in Ireland. Habeas Corpus Act suspended.		1848. Abdication of Louis Philippe, and a republic proclaimed. Louis Napoleon, President. Bloody insurrection in Paris.	1848. Rising of the great Italian cities in revolution Roman republic overthrown

XIV. FROM THE ESTABLISHMENT OF THE SECOND FRENCH REPUB

GREAT EVENTS OF PERIOD. Continued rapid advancement of science, inventions and Italy. Commercial treaties with China and Japan. American Civil War. Union of Austria

A. D.	United States	Spain and Portugal	Great Britain	France	Italy and Church
	1849. Zachary Taylor, President. Railroad from Boston to New York.		1849. Mooltan in India taken.	1848-1852. **Second Republic.**	1849. Catania, Syracuse, and Palermo. taken by assault. MAZZINI's proclamation of provisional government. VICTOR EMANUEL, King. Rome surrenders to the French; Garibaldi leaves city. Bourbon rule begins.
1850	1850. Attempted invasion of Cuba by filbusters Death of President Taylor; Millard Fillmore. President. Texas boundary settled. Fugitive Slave Law passed.		1850. The war in Lahore ended. The Punjab annexed to the British Crown. 1850-1853. Kafir War in South Africa.	1850. Jerome Bonaparte, Field-Marshal.	
	1851. Erie railway opened. Charleston Convention. Kossuth arrives in New York.	1851. Death of Dodoy, "Prince of Peace."	1851. Continuance of the Kafir war. Kossuth visits England.	1852-1870. **Second Empire.**	1852. CAVOUR becomes Prime Minister in Piedmont.

LISHMENT OF THE SECOND FRENCH REPUBLIC, 1783 - 1848 A. D.— Continued

Scandinavia, Holland, Belgium, Switzerland	Germany	Prussia and Poland	Russia	Ottomans, China, India, Japan	A. D.
					1825
1830. Belgium revolts from Holland, and is declared independent by the Great Powers.	1829-1834. Prussia, Bavaria, and finally all Germany, save Austria, unite in a Zollverein or Customs-Union, which gave great impetus to trade and helped towards national unity.				
1831. Leopold I., King of the Belgians. New constitution for Denmark, Sleswick and Holstein; with representative local councils.	1831. Austria interferes in Italian affairs.		1832. Poland made part of Empire.	1832. Kingdom of Greece founded.	
	1836. Visit of the Emperor of Russia. Ferdinand I., Emperor.				
1839. Christian VIII. succeeds.	1838. Commercial treaty with England.		1838. Smuggling carried on extensively.	1839-1842. China: Opium War with Great Britain. Hong Kong ceded to latter.	
1840. William I. abdicates as King of Holland.	*RICHARD WAGNER* 1813-1883	1840. Frederick William, King.			
				1843. Greece: King Otho compelled to accept constitution, Sept. 15.	
			1845. Emperor visits England.	1844. China: Commercial treaty with United States.	
	1847. Austria takes possession of Cracow.				
1848. Holland receives a Constitution. Denmark: Frederick VII., King; revolt of Schleswig-Holstein.	1848. Revolution in Hungary. FRANCIS JOSEPH, Emperor. Kossuth withdraws his army from Vienna.	1848. Insurrection in Berlin.			

LIC TO THE FOUNDING OF THE GERMAN EMPIRE, 1848 - 1871 A. D.

discoveries. Increased philanthropic effort and intellectual enlightenment. Unification of and Hungary. Franco-Prussian War. Establishment of the German Empire.

Holland, Belgium, Switzerland, Scandinavia	The German Confederation		Russia	Turkey, Greece, China, India, Japan	A. D.
	Prussia	Austria			
	1849. The king declines the Imperial Crown. Armistice between Prussia and Denmark.	1849. New constitution promulgated.	1849. Aids Austria in subduing Hungary.		
1850. Denmark: Bloody battle of Idstedt, between the Danes and Schleswig-Holsteiners.	1850. Treaty of peace with Denmark. New constitution for Prussia.		1850. Harbor of Sebastopol completed.	1850. Turkey: Insurrection in Bosnia. 1850-1864. China: Taiping rebellion.	1850
		1851. LOUIS KOSSUTH sentenced to death at Pesth. 1852. Emperor of Austria visits Emperor of Prussia.		1852. Greece: Convention of London by England, France, Prussia, Bavaria and Greece in reference to the affairs of Greece.	

XIV. FROM THE ESTABLISHMENT OF THE SECOND FRENCH REPUBLIC

A. D.	United States	Spain and Portugal	Great Britain	France	Italy and Church
1850					
	1853. Franklin Pierce, President. Gadsden Purchase.		1853. Queen Victoria visits Ireland. Kafir war ended.	1852. NAPOLEON III. declared Emperor.	
	1854. Treaty with Japan. Kansas-Nebraska Bill passed. Ostend Manifesto issued.	1854. Military insurrection under O'Donnell.	1854-1856. CRIMEAN WAR. Treaty of alliance with France.	1854. War declared against Russia.	
	1855. Panama Railroad completed. Troubles in Kansas.		1855. British fleet bombards and partially detroys Canton, China. *ROBERT BROWNING* (1812-1889)		1855. Important concordat between Italy and Austria.
	1857. Dred Scott decision. James Buchanan, President. Great financial panic.		1857-1858. SEPOY MUTINY. Sepoys vs. English.	1856. Peace with Russia.	
	1859. John Brown capcaptures Harpers Ferry.	1859. War with Morocco.	1858. Completion of the Atlantic telegraph cable.	1859. THE WAR OF ITALIAN LIBERATION. Sardinia - Piedmont and France vs. Austria.	
	1860. South Carolina passes ordinance of secession. 1861-1865. AMERICAN CIVIL WAR. Federal Government of United States vs. Southern Confederacy. ABRAHAM LINCOLN, President. 1863. **Battle of Gettysburg.**	1860. Defeat of the Moors. 1861. Annexation of Santo Domingo. Intervention in Mexico.	1860. Rebellion in India subdued. Neutrality proclaimed during the American Civil War. *TENNYSON* (1809-1892) *DARWIN* 1809-1882.	1860. Commercial treaty with England. 1862. Great distress caused by American Civil War. 1863. The French occupy Mexico.	1860. GARIBALDI lands in Sicily, and assumes dictatorship. 1861. Victor Emanuel II., King of Sardinia, first King of Italy. 1862. Garibaldi establishes a provisional government.
		1864. Rupture with Peru.		1864. Maximilian accepts Mexican crown.	1864. Florence made the capital of Italy.
	1865. Assassination of President Lincoln; Andrew Johnson, President. 1866. Civil Rights Bill passed. Atlantic telegraph completed.	1865. Dispute with Chile. 1866. Military insurrection headed by General Prim.	1865. Fenian outbreaks in Ireland. British and French governments rescind their recognition of the Confederate States of America.		1865. Ionian Isles made over to Greece. 1866. Austrian War. Venetia proclaimed a part of Italy.
	1867. General amnesty proclamation. Purchase of Alaska. 1868. Burlingame treaty with China. 1869. U. S. GRANT, President. Union Pacific railway opened for traffic.	1867. Death of Marshal O'Donnell. 1868. Queen deposed.	1868. GLADSTONE, Premier.	1867. Great exposition in Paris. *PASTEUR* 1822-1895	1867. Garibaldi and the Papal States. 1869. Vatican Council opened at Rome.
		1870. Isabella II. abdicates; Amadeus, King.	1870. Irish Land Act passed.	1870. **Third Republic.** 1870-1871. FRANCO-PRUSSIAN WAR. France vs. Prussia supported by all German States including South. **Battle of Sedan.** Surrender of Metz.	1870. Rome is annexed to Italy and declared the capital.
		1871. Sagasta, Prime Minister.	*HERBERT SPENCER* (1820-1903)	1871. Capitulation of Paris. Peace ratified.	

TO THE FOUNDING OF THE GERMAN EMPIRE, 1848-1871 A. D.—Continued

Holland, Belgium, Switzerland, Scandinavia	The German Confederation: Prussia	The German Confederation: Austria	Russia	Turkey, Greece, China, India, Japan	A. D.
					1850
1853. Denmark: Parliament prorogued and a "fundamental" law issued.	1853. Plot to overthrow the government.		1853. War declared against Turkey.		
1853. Belgium: Marriage of the Duke of Brabant, heir-apparent of the throne, and the Archduchess Maria. Holland: The first chamber adopts the much-disputed law on religious liberty.	1854. Treaty with Austria, offensive and defensive.	1854. Alliance with England and France.	1854-1856. CRIMEAN WAR. Russia vs. Turkey aided by Great Britain, France and Sardinia. 1854. War with France and England. Siege of Sebastopol. Battle of Balak-lava. 1855. Death of Nicholas I. Alexander II., Emperor.	1852. Turkey: War between the Turks and Montenegrins. 1854. Japan: Treaty with the United States.	
		1856. Hungarians granted amnesty.	1856. Destruction of Sebastopol docks. Evacuation of Crimea. 1858. Partial emancipation of the serfs.	1857-1858. Sepoy Mutiny. 1857-1860. China: Second war with Great Britain.	
1859. Sweden: Oscar I., died July 8; succeeded by his son Charles XV.	1859. THE WAR OF ITALIAN LIBERATION.	Peace after battle of Solferino.			
	1861. WILLIAM I., King.	1861. New constitution for the Austrian monarchy.			
	1862. BISMARCK, Premier.	1862. Amnesty to political offenders in Hungary.	1862. Nesselrode, Chancellor.	1862. Bloody conflict between Servians and Turks in Belgrade.	
1863. Denmark: Christian IX. succeeds Frederick VII.	1863. King resolves to govern without parliament. Congress of German sovereigns at Frankfort. "One Federal State" proposed.		1863. Termination of serfdom.		
1864. Peace between Denmark and the allies, to whom Schleswig-Holstein and Lauenburg are surrendered. 1865. Leopold II. succeeds his father, Leopold I. in Belgium.	1864. DANISH WAR. vs. Denmark.	Austria and Prussia	1864. Emigration of Caucasian tribes into Turkey.	1864. George of Denmark becomes King of Greece.	
	1866-1871. **North German Confederation.** 1866. AUSTRO-PRUSSIAN WAR. Prussia with smaller North German States and Italy vs. Austria, Hanover, Saxony and South German States.		1866. Inauguration of trial by jury. War with Bokhara.		
	1867. North German Constitution accepted. *HELMHOLTZ* 1821-1894	**Austria-Hungary** 1867. Autonomy for Hungary announced. Emperor crowned King of Hungary.	1867. Alaska sold to the United States.	1868. Japan: End of the Shogunate. Restoration of the Mikado.	
	1870-1871. FRANCO-PRUSSIAN WAR. Battle of Sedan.	1870. Concordat with Rome suspended.			
HENRIK IBSEN 1828-1908	1871——. **House of Hohenzollern.**				
	1871. King of Prussia proclaimed Emperor of Germany.	1871. New German Empire recognized.	1871. Electric telegraph between Russia and Japan.	1871. Japan: Feudalism abolished.	

XV. FROM THE FOUNDING OF THE GERMAN EMPIRE TO THE CLOSE OF

A. D.	United States	Spain and Portugal	Great Britain	Holland, Belgium, Switzerland, Scandinavia	France
			1873. Payment of Alabama claims to the United States.	1872. One thousandth anniversary of kingdom of Norway celebrated. Death of Charles XV. of Sweden, succeeded by Oscar II. Coinage made uniform in Denmark, Sweden and Norway.	1873. Marshal MacMahon, president. 1874. Death of Guizot.
		1874. Alfonso XII., king. 1875. Civil war.			
1875					
	1877. R. B. Hayes, president.		1876. Queen Victoria proclaimed Empress of India.		
					1879. Jules Grevy, president.
1880					
	1881. James A. Garfield, president. President Garfield assassinated, July 2d; Chester A. Arthur, president.	1883. Sagasta again minister.	1882. Attempt on life of Queen Victoria.		
	1885. Grover Cleveland, president. Apache Indian War.				
			1887. Queen's Jubilee.		1887. Sadi-Carnot, president.
	1889. Benjamin Harrison, president. Johnstown flood.	1889. Trial by jury first put in force. Accession of Carlos I. to Portuguese throne on death of his father, Luis I.	1889. Great labor strikes.		
1890	1890. McKinley tariff bill passed.	1890. Castillo, premier.	1890. Stanley returns from Africa.	1890. Holland: William III. of the Netherlands dies, and is succeeded by his daughter, Wilhelmina, under the regency of her mother.	1890. War with Dahomey.
				1891. Switzerland: Celebration of the six hundredth anniversary of the foundation of the Swiss Confederacy.	1892. Panama scandals.
	1893. Grover Cleveland, president. Chinese exclusion bill approved. World's Columbian exposition at Chicago.	1893. War with Morocco.	1893. Behring Sea arbitration.	1893. Belgium: Universal suffrage in combination with plural voting established.	
			1894. Manchester ship canal opened.	1894. Denmark: Fall of the Estrup ministry, succeeded by a cabinet under Reedz-Thott.	1894. President Carnot assassinated at Lyons. M. Casimir-Perier, president. Captain Dreyfus tried and imprisoned. 1895. President Casimir-Perier resigns. M. Felix Faure, president. Death of PASTEUR.
	1897. William McKinley, president.	1897. Assassination of Premier Canovas del Castillo. Scheme of Cuban autonomy approved.	1897. Blackwell tunnel opened. The Queen's Diamond Jubilee celebrated.	1896. Belgium: International Bimetallic Congress assembles at Brussels.	1897. Ten-hour law for railway employes passed.
	1898. Destruction of the "Maine" at Havana. Spanish-American war between United States and Spain. Treaty of Paris.		1898. Death of Gladstone. Irish local government bill passed. Imperial penny postage goes into effect.		1898. Review of Dreyfus case granted.

THE EUROPEAN WAR AND THE RECONSTRUCTION OF EUROPE, 1871-——

Italy and Church	Germany	Austria-Hungary	Russia	Turkey and Balkans, China, India, Japan	A. D.
	1871. William I., emperor.		1873. Khiva captured.		
				1875. Insurrection against the Turks in Herzegovina. Insurrection in Bosnia.	1875
	1877. Attempted assassination of emperor.		1877. War against Turkey.	1876. Sultan Murad deposed; Abdul Hamid II. succeeds.	
1878. Death of Victor Emmanuel II. Humbert, king. Death of Pius IX. Leo XIII., pope.		1878. Occupation of Bosnia.	1878. Spread of Nihilism in the empire. 1880. Many Nihilists imprisoned and executed.	Six weeks' armistice between Turkey and Servia. Constitution for Turkey announced.	1880
1882. Death of Garibaldi.	1883. Italy joins the alliance between Germany and Austria, thus forming the Triple Alliance.	1882. Six hundredth anniversary of the House of Hapsburg.	1881. Alexander II. assassinated. Alexander III., emperor.	1881. Roumania declared a kingdom.	
1885. War with Abyssinia.	1884. German annexations on African slave coast; December 19, in Pacific Ocean, beginnings of German colonial policy.		1885. Ship canal from St. Petersburg to Cronstadt opened. Trouble with the Afghans.	1885. Outbreak of war between Servia and Bulgaria.	
1887. Alliance of Italy with Austria-Hungary and Germany signed. Crispi, prime minister.	1888. Accession and death of Frederick III. William II., emperor.	1886. Army put on war footing of one million five hundred thousand men.	1886. Russia interferes in Bulgaria. 1888. Central Asian railway opened.	1886. Servia, Bulgaria and Greece compelled by the powers to disarm. Treaty of peace signed between Servia and Bulgaria. 1889. Japan's Constitution proclaimed.	
	1890. Resignation of Bismarck as chancellor.		1890-1892. Famine through the empire.		1890
1891. Treaty of Italy with Great Britain relative to East Africa. Triple Alliance renewed.	1891. Triple Alliance renewed.	1891. Renewal of Triple Alliance.	1891. Imperial ukase orders expulsion of Jews from Moscow.		
1893. Pope's Jubilee at Rome.	1893. Anti-Jesuit law repealed.				
	1894. Commercial treaty with Russia. New parliament house opened.	1894. Commercial treaty with Russia ratified.	1894. Death of Alexander III. Nicholas II., czar.	1894. Turkey: British, French and Russian ambassadors present note to sultan demanding reforms in Armenia. 1894-1895. Chinese-Japanese war.	
	1895. North Sea and Baltic canal opened. Restrictions imposed on American insurance companies.	1895. Anti-Semitic agitation.	1895. Diplomatic relations with Abyssinia. Persecution of the Jews.		
1896. Peace with Abyssinia. Italy abandons her claims to a protectorate over that country.	1896. New civil code for the empire completed.	1896. Archduke Karl Ludwig, heir to the throne, dies. Millennial exposition at Budapest.	1896. First official census of the empire. 1897. Judicial reform in Siberia.	1897. Turko-Grecian war. China: Kiau-Chau, with surrounding zone, leased to Germany for ninety-nine years.	
1898. Pope offers to mediate in the Cuban question.	1898. Death of Bismarck. Emperor visits Constantinople and Jerusalem.	1898. Assassination of the empress by an anarchist at Geneva. Ausgleich of 1867 renewed.	1898. Port Arthur leased from China.	Port Arthur and Talien-wan leased to Russia for twenty-five years.	

XV. FROM THE FOUNDING OF THE GERMAN EMPIRE TO THE CLOSE OF

A. D.	United States	Spain and Portugal	Great Britain	Holland, Belgium, Switzerland, Scandinavia	France
	1899. Cuba is relinquished by Spain. Philippines and Porto Rico acquired.	1899. Death of Premier Canovas of Spain. Spain sells the Caroline, Pelew and Ladrone islands to Germany.	1899. The Boer war in South Africa.		
1900	1900. Civil government established in the Philippines. Chinese troubles.		1900. Field Marshal Roberts takes command in South Africa.		
	1901. Assassination of President McKinley by the anarchist Czolgosz. Capture of Aguinaldo. Death of ex-President Harrison.		1901. Census of the Indian empire taken. Death of Queen Victoria and accession of Edward VII.	1901. The Norwegian Parliament confers the franchise in municipal and communal elections on women tax-payers. Marriage of Queen Wilhelmina of the Netherlands to Duke Henry of Mecklenberg-Schwerin.	1901. Diplomatic relations with Turkey suspended.
	1902. Cuban independence under Platt amendment. President Roosevelt recommends the purchase of the Panama Canal company.	1902. Alfonso XIII., king.	1902. The British-Japanese alliance signed. Boer war ended. Marquis of Salisbury resigns as premier.		1902. M. Combes forms a new French ministry.
	1903. Panama Canal treaty signed with Colombia. Commercial treaty with China signed. Independence of Panama recognized.		1903. King Edward visits the king of Italy. Irish land bill passed the Houses of Parliament.		1903. Dreyfus case reopened. President Loubet visits King Edward.
	1904. Great Baltimore fire. U. S. Senator Burton convicted of malfeasance in office. St. Louis exposition opened.	1904. Death of ex-Queen Isabella at Paris.	1904. Col. Younghusband enters Tibet.		1904. Arbitration treaties with Holland, Spain, Sweden, Norway and the United States. Bill for separation of church and state introduced.
	1905. Protocol with Santo Domingo.	1905. Attempted assassination of the king in Paris.	1905. Resignation of Lord Curzon as viceroy of India.	1905. Norway: Haakon VII., king.	1905. The Moroccan situation grows in complexity.
	1906. Riot at Brownsville, Texas. The president visited Panama. Great earthquake at San Francisco.	1906. King Alfonso married to Princess Victoria of England.	1906. King Edward visits Paris.	1906. Death of King Christian of Denmark. Norway and Sweden independent kingdoms. The crown prince of Denmark is proclaimed King Frederick VIII. The Belgian Chamber votes in favor of annexing the Congo Free State.	1906. M. Fallierès, president. The church controversy The Pope's encyclical. M. Sarcien, premier.
	1907. Phillippine assembly opened.	1907. King and queen visit England.	1907. King Edward and Emperor Francis Joseph meet at Ischl.	1907. Death of Oscar II. of Sweden. Gustav V., king. Norwegian Parliament votes to grant the suffrage to about three hundred thousand women, based upon a property qualification.	1907. Wine growers' agitation. French occupation of Morocco.
	1908. Voyage of the Pacific fleet to Asiatic waters. 1909. Tariff revised.		1908. Asquith, premier.	1909. Belgium: Albert I., king.	
1910	1910. Elections result in great Democratic gains.	1910. Spain recalled its envoy to the vatican. Portugal becomes a republic.	1910. Death of King Edward VII. Accession of George V.	1910. Denmark: Christian X., king.	1910. Briand cabinet resigned.
	1911. Extra session of Congress called by President Taft. Canadian reciprocity bill passed. 1912. Tariff revision begun by Congress.	1911. Further creation of religious orders prohibited.	1911. King George formally opens the British Parliament. 1912. King George returns from Durbar, in India. Steamship "Titanic" sinks with appalling loss of life.		1911. New ministry formed by premier.

THE EUROPEAN WAR AND RECONSTRUCTION OF EUROPE, 1871-————Continued

Italy and Church	Germany	Austria-Hungary	Russia	Turkey and Balkans, China, India, Japan	A. D.
1900. Assassination of King Humbert of Italy, Victor Emmanuel III., king.	1900. Abolition of the Roman law throughout Germany.	1900. Marriage of the heir apparent, Francis Ferdinand.	1899. Czar proposes universal peace. The Finnish diet is deprived of the exclusive right of legislation and a thorough policy of Russification begun.	1900. China: Boxer uprising.	1900
	1901. Bicentenary of the coronation of the first king of Prussia.		1901. Count Tolstoi excommunicated.	1901. Turkey pays to the United States the claims advanced in behalf of the missionaries in Asia Minor for losses incurred during the Armenian disturbances of 1895-1896.	
	1902. Prince Henry of Prussia visits the United States. England and Germany press their Venezuelan claims.	1902. Triple Alliance renewed. The language question between Germany and Czechs.		1902. Treaty of alliance signed between Great Britain and Japan.	
1903. Death of Pope Leo XIII. Pope Pius X.		1903. New tariff bill. Visit of the czar of Russia.	1903. Russo-Japanese crisis.	1903. Servia: A band of conspirators invade the royal palace and slay King Alexander and Queen Draga. The national assembly choses Peter Karageorgevitch king.	
1904. King and queen of Italy visit England.	1904. German troops defeated in Africa.	1904. Ultimatum to the Sultan issued. Great railway strike.	1904. War with Japan over Manchuria begun.	1904. Japanese war with Russia.	
1905. The railway bills passed in Italy.	1905. Intervention of Germany in Moroccan affairs. The new commercial treaties. Marriage of the crown prince.	1905. Treaty with Germany ratified. Universal suffrage on an educational basis advocated.	1905. Fall of Port Arthur and end of war. Great railway strike at Petrograd, Warsaw and Moscow. Constitution granted by czar and the Duma authorized.	1905. The Russo-Japanese peace treaty ratified.	
1906. Scnnino, premier. International exhibition at Milan.	1906. Propaganda against Socialism.	1906. Prince Schillingfurst succeeds Baron Gautch.	1906. The czar opened the first Russian Duma.		
1907. Italy signs arbitration treaty with Argentina.	1907. German emperor visited London.	1907. Universal suffrage bill passed.	1907. Third Russian Duma convened. Resignation of Count Witte as prime minister of Russia.	1907. Abdication of Korean emperor.	
		1909. Bosnia and Herzegovina acquired.			
1910. Decree issued by the king of Greece for a revision of the constitution.	1910. Emperor William received ex-President Roosevelt.		1910. Death of Count Tolstoi.	1910. Japan annexed Korea. Montenegro became a kingdom with Nicholas as king.	1910
1911. Second Parliament assembles. 1911-1912. War with Turkey over Tripoli.	1911. The Emperor urged a policy of reclamation.	1911. Austria strengthens her army and navy.	1911. Russian army mobilized on Chinese frontier. Premier Stolypin assassinated.		
	1912. Large Socialist gains in German Diet.	1912. Death of Premier Aerenthal.		1912. Greece joins Balkan Allies in war against Turkey. Death of Mutsuhito; Yoshito becomes mikado of Japan.	

XV. FROM THE FOUNDING OF THE GERMAN EMPIRE TO THE CLOSE OF

A. D.	United States	Spain and Portugal	Great Britain	Holland, Belgium, Switzerland, Scandinavia	France
	1913. Democratic Party comes into power. Parcels Post System inaugurated. Woodrow Wilson inaugurated president.	1913. Continued Strife between Royalists and Republicans. Attempted assassination of King Alfonso.	1913. Colonies aid policy of Naval Expansion.		1913. Raymond Poincaré inaugurated president.
	Greatest European War in History begins with the British Empire, France, Russia, Belgium, Japan, on the other.				
	1914. Anti-trust legislation begun in Congress. Declares neutrality in the European war. New regional banking system goes into operation. Panama Canal officially opened.	1914. Portuguese cabinet resigns. Bernardino Machado, premier. Portugal supports the Triple Entente.	1914. King George urges mutual concessions in Irish Home Rule controversy. Wages war on the Teutonic Alliance as a member of Triple Entente.		1914. A new political party is formed to be known as the Briandist. Joins Great Britain and Russia in war upon Teutonic Alliance.
	1915. American protectorate established over Haiti. La Follette Seaman's Act passed by Congress. Diplomatic interchanges with Germany concerning rights of neutral ships.	1915. The Spanish cabinet resigns. Spain maintains strict neutrality in European war.	1915. War Council created to direct the policies of the Allies in the European war.	1915. Holland continues her policy of strict neutrality. Belgium passes under the military rule of Germany.	1915. The Viviani coalition ministry resigned. Immense war loans successfully floated.
	1916. Year of great industrial and commercial activity and high prices. Woodrow Wilson re-elected President. Woman suffrage a pronounced political power.	1916. Martial law is declared throughout Spain on account of the widespread railway strike.	1916. British and French forces compelled to withdraw from operations against the Dardanelles with disastrous losses. David Lloyd George made premier with practically dictatorial powers.	1916. Frequent Belgian protests against German military rule. Many Belgians deported to Germany as a military measure.	1916. Verdun is successfully defended against violent assaults of the Germanic forces.
	1917. Famous "Peace Note" issued to the nations of the world by President Wilson. War declared by the United States on Germany, and war loan of seven billion dollars passed by Congress.	1917. Seventh attempt made upon the life of King Alfonso.	1917. Great Britain rejects the peace overtures of the Central Powers. Sends envoys, headed by ex-premier Balfour, to United States for Allied War Council.		1917. France joins Great Britain in rejecting the Kaiser's peace overtures. Ex-premier Viviani and General Joffre sent to United States as members of the Allied War Council.
	1918. Far-reaching centralization of governmental powers due to participation in the European war. Nov. 11. Armistice is signed.	1918. Great internal unrest due to war conditions in Europe.	1918. Remarkable achievements in war efficiency evident. Home rule for Ireland in the balance.	1918. Distressing conditions continue in these countries over neutrality issues.	1918. Gen. Foch named by Allied war Council commander-in-chief. Nov. 11. Armistice signed, and Kaiser flees to Holland.
	1919. Peace Conference opens at Paris, with President Wilson at head of American conferees.	1919. Continued disturbances between royalist and republican groups.	1919. England declares for League of Nations to promote and maintain peace.		1919. Peace Conference sits at Paris.
	1920–22. Versailles Treaty rejected by U. S. Senate (1920). Eighteenth Amendment providing for nationwide prohibition in effect (Jan. 16, '20). Arms Treaties ratified (1922). Woman Suffrage Amendment to Constitution adopted.	1920–22. King Alfonso cultivates closer relations with France.	1920–22. Irish Peace Treaty ratified (1921). Irish Free State established (Jan. 14, '22). Premier Lloyd-George resigns; succeeded by Bonar Law.	1920–22. Industrial and economic conditions in Holland, Switzerland and Scandinavia show rapid improvement.	1920–22. Millerand president, former president Poincaré premier inaugurate a vigorous policy of reconstruction.
	1923. U. S. troops withdrawn from the Rhine. President Harding died, Aug. 2; Calvin Coolidge became President, Aug. 3.	1923. Continued military campaigns into Morocco.	1923. Resignation of Premier Law; Stanley Baldwin named in succession.	1923. Fourth Assembly of the League of Nations meets in Geneva, Switzerland.	1923. French army occupies the Ruhr in an effort to collect German indemnity.
	1924. Death of Ex-President Wilson (Feb. 3)		1924. Ramsay Macdonald first Labor premier.	1924. Belgium reduces national budget.	1924. Vigorous policy of Poincaré still continued against Germany.

THE EUROPEAN WAR AND RECONSTRUCTION OF EUROPE, 1871- — Continued

Italy and Church	Germany	Austria-Hungary	Russia	Turkey and Balkans, China, India, Japan	A. D.
	1913. Declares support of Triple Alliance.	1913. Mobilize army on Servian frontier to conserve interests of Empire pending Balkan war.	1913. Serfdom obliterated from entire empire.	1913. Assassination of King George of Greece. Constantine, king. China a republic; Yuan, president.	
Servia, Italy, Portugal and Roumania on one side, and Germany, Austria-Hungary, Turkey and Bulgaria					
	1914. Germany's new fiscal policy lays a tax on royalty. Declares war on the Triple Entente.	1914. Austria adopts a strong policy against Balkan expansion. Joins Germany in a declaration of war on the Triple Entente.	1914. Russian Premier Kokovtsov resigns. As a member of the Triple Entente joins in war on the Teutonic Alliance.	1914. Greece retains the Ægean islands wrested from Turkey.	
1915. Italy joins the Triple Entente in the war. Declares war on Bulgaria.	1915. Wages a ruthless submarine war on allied shipping and neutral vessels carrying contraband of war.	1915. At the suggestion of the United States, its Ambassador, Dr. Dumba, is recalled from Washington.	1915. Russia declares war on Bulgaria. Loses Poland and its capital, Warsaw, to the Teutonic Allies.	1915. Bulgaria enters the war on behalf of the Teutonic Allies. Yoshohito crowned emperor of Japan.	
1916. Italian military movements ineffective on the Austrian frontier. A change of ministry forecasted.	1916. German military operations and conquests stand out in marked contrast with those of the Entente Allies.	1916. Austria-Hungary proves a powerful aid to the Teutonic Allies in the Balkans. Emperor Francis Joseph dies and is succeeded on the throne by Emperor Charles I.	1916. Premier Sturmer resigns and is succeeded by M. Trepoff. Russian and Roumanian armies are defeated and driven back with frightful losses in the Balkans.	1916. Roumania enters the war on side of the Entente, and is conquered by the Teutonic-Bulgar forces. President Yuan of China assassinated. Li Yuan-hung becomes president.	
1917. Conference of Entente Allies held in Rome. Much discontent in Italy over the war.	1917. The German government sends peace overtures to belligerent and neutral nations. Germany declares a rigid blockade of the Entente Powers.	1917. Austro-Bulgarian army makes a strong drive against Roumania and Russia. Emperor Charles crowned King of Hungary.	1917. Russian monarchy overthrown; Czar abdicates and a republic is established.	1917. Great political unrest in India. Turkey revokes all treaties limiting her absolute independence as a nation.	
1918. Great counter-offensive by the Italian and French forces.	1918. Russian resistance completely overcome by Germans. Germany makes overtures for armistice; the Kaiser flees to Holland.	1918. Austria-Hungary falls with her ally, and dissolution of the empire follows. Emperor Karl abdicates, and republics are formed.	1918. Russian stability almost destroyed by Bolshevism. Civil wars and anarchy rule.	1918. Roumania makes peace with Central Powers and Russia. Cedes the Dobrudja region to Bulgaria. Collapse of Turkey complete.	
1919. Italy makes large territorial claims, but composes her demands at the Paris Peace Conference.	1919. Germany is permitted no representatives at the Paris Peace Conference.			1919–20. Japanese forces attempt to establish order in Siberia. Japan promises to restore Shantung to China.	
1920–22. Death of Pope Benedict, Jan. 22, '22. Pius XI., crowned Pope Feb. 12, '22. Fascisti faction becomes political power.	1920–22. Peace Treaty between U. S., Germany and Austria signed and ratified (1921). Wilhelm Cuno becomes Chancellor. Commercial Treaty with Russia becomes effective.	1920–22. Peace Treaty with United States ratified (1921). Ex-Emperor Charles dies at Funchal, Madeira.	1920–22. Soviet government in complete control. Commercial Treaty with Germany ratified.	1920–22. Turkey-Ukrainia Peace Pact signed (1922). Angora National Assembly dethrones Sultan and ends Ottoman Empire.	
1923. Mussolini, vigorous leader of the Fascisti, Premier of Italy.	1923. The Ruhr valley and mining region occupied by the French army. Dr. Streseman made Chancellor.	1923. Economic conditions greatly improved through financial assistance of friendly powers.	1923. New Constitution proclaimed by the United States of Russia modeled after that of U. S. and England.	1923. Kemal Pasha develops strong leadership in Turkey.	
1924. Constitutional government reestablished.	1924. Reparation experts plan to stabilize currency.		1924. Death of Lenine. Soviet government officially recognized by Great Britain.		

THE WORLD as it is known to-day comprises six great divisions or parts, namely, Europe, Asia, Africa, North America, South America, and Oceania or Australasia. The most dependable statistics estimate their *area* and *population* as follows:

AREA AND POPULATION OF THE EARTH BY CONTINENTS

Continental Divisions	Area in Square Miles	Inhabitants	
		Number	Per Square Mile
Africa	11,622,619	142,751,000	12.3
America, N.	8,589,257	140,084,000	16.3
America, S.	7,570,015	56,337,775	7.4
Asia	17,206,000	872,522,000	50.7
Australasia	3,312,613	16,228,591	4.9
Europe	3,872,561	464,681,000	120.
Polar Reg.	5,081,935	.....	.....
Total	57,255,000	1,692,604,366	29.6

Statistics of the National Geographic Society, Washington, 1918.

POPULATION OF THE EARTH ACCORDING TO RACE

Race	Location	Number
Indo-Germanic or Aryan (white)	Europe America Persia India Australia	796,000,000
Mongolian or Turanian (yellow and brown)	Asia	630,000,000
Semitic (white)	Africa Arabia, etc.	70,000,000
Negro and Bantu (black)	Africa	134,000,000
Malay and Polynesian (brown)	Australasia	35,000,000
American Indian, North and South (red and half breeds)	.....	27,000,000
Total	.....	1,692,000,000

At the beginning of 1920 the human race was subject to sixty-six independent and five quasi-independent governments.

The *absolute monarchies* are Abyssinia, Afghanistan, Arabia, Morocco, Siam, Oman, and Monaco; the *limited monarchies* are Albania, Belgium, Bhutan, British Empire, Bulgaria, Denmark, Greece, Hedjaz, Holland, India, Italy, Japan, Jugoslavia, Luxemburg, Nepal, Norway, Persia, Roumania, Spain, Sweden, and Turkey; the *republics* are Andorra, Argentina, Austria, Baltic State, Bolivia, Brazil, Czecho-Slovakia, Chile, China, Colombia, Costa Rica, Cuba, Danzig, Ecuador, Finland, France, Germany, Guatemala, Haiti, Honduras, Hungary, Liberia, Lithuania, Mexico, Nicaragua, Panama, Paraguay, Peru, Poland, Portugal, Russia, Salvador, San Marino, Dominican Republic, Switzerland, Ukrania, United States, Uruguay, Venezuela; the *responsible governments* are Australia, Canada, New Zealand, Union of South Africa; *protectorate*, Egypt.

PRINCIPAL LANGUAGES SPOKEN

There are said to be 3,424 spoken languages or dialects in the world, distributed as follows: America, 1,624; Asia, 937; Europe, 587; Africa, 276.

Languages	Number of Persons Spoken by		Proportion of the Whole	
	1801	1916	1801	1916
English	20,520,000	160,000,000	12.7	27.3
French	20,520,000	70,000,000	12.7	1.19
German	30,320,000	130,000,000	18.7	22.2
Italian	15,070,000	50,000,000	9.3	8.6
Spanish	26,190,000	50,000,000	16.2	8.6
Portuguese	7,480,000	25,000,000	4.7	4.3
Russian	30,770,000	100,000,000	19.0	17.1
Total	161,800,000	585,000,000		

RELIGIOUS POPULATION OF THE WORLD BY CONTINENTS

Religion	Europe	Asia	Africa	North America	South America	Oceania	Total Followers
Catholic Churches:							
Roman Catholic	195,000,000	10,000,000	3,000,000	37,000,000	35,000,000	8,000,000	288,000,000
Eastern Churches	99,000,000	17,000,000	4,000,000	1,000,000	.....	.....	121,000,000
Protestant Churches	96,000,000	10,000,000	12,000,000	43,000,000	1,000,000	5,000,000	167,000,000
Total Christians	390,000,000	37,000,000	19,000,000	81,000,000	36,000,000	13,000,000	576,000,000
Jews	10,892,000	357,000	360,000	3,530,000	114,000	19,000	14,972,000
Mohammedans	4,000,000	145,000,000	52,000,000	25,000	15,000	26,000,000	227,040,000
Buddhists	1,000	140,000,000	15,000	1,000	5,000	25,000	140,047,000
Hindus	2,000	215,000,000	325,000	50,000	100,000	35,000	215,512,000
Confucians and Taoists	15,000	310,000,000	40,000	120,000	15,000	725,000	310,925,000
Shintoists	1,000	25,000,000	2,000	1,000	5,000	6,000	25,015,000
Animists	2,000	43,000,000	99,000,000	20,000	1,250,000	18,000,000	161,272,000
Unclassified	2,000,000	10,000,000	200,000	9,000,000	25,000	150,000	21,375,000
Total non-Christian	16,913,000	888,357,000	51,962,000	12,747,000	1,529,000	44,960,000	1,116,158,000
	406,913,000	925,357,000	170,962,000	93,747,000	37,529,000	57,960,000	1,692,158,000

INDEPENDENT COUNTRIES OF THE WORLD TODAY

COUNTRIES	POPULATION	SQUARE MILES	CAPITALS	PRESENT OFFICIAL HEAD AND DATE OF BIRTH	TITLE AND DATE OF ACCESSION	SALARY OR BUDGET
EAST HEMISPHERE						
(1) Europe						
Albania	825,000	11,000	Durazzo	Essad Pasha (b....	President (1914)	.....
Andorra	6,000	175	Andorra	.....	Consul	.....
Austria	8,000,000(est.)	25,000(est.)	Vienna	Karl Seitz (b....)	President (1919)	.....
Baltic State	3,103,300	36,198	Reval	.....	.....	.....
Belgium	7,542,968	11,787	Brussels	Albert (b. 1875)	King (1909)	$623,600
Bulgaria	4,467,000(est.)	43,310(est.)	Sofia	Boris III. (b. 1894)	Tzar (1918)	250,000
Czecho-Slovakia	13,500,000(est.)	60,000(est.)	Prague	T. G. Masaryk (b. 1850)	President (1918)	.....
Danzig	250,000(est.)	729(est.)	Danzig	.....	Burgomeister	.....
Denmark	2,775,076	15,592	Copenhagen	Christian X. (b. 1870)	King (1912)	262,500
Finland	3,277,000	144,249	Helsingfors	K. J. Ståhlberg (b. 1865)	President (1919)	.....
France	83,060,459	3,663,086	Paris	Alexandre Millerand (b. 1859)	President (1920)	140,000
Germany	53,364,232	170,826	Berlin	Friedrich Ebert (b. 1870)	President (1919)	.....
Great Britain	See page 467	.....	.....	George V. (b. 1865)	King (1910)	2,350,000
Greece	4,821,300	41,933	Athens	Alexander (b. 1893)	King (1917)	260,000
Holland	6,800,000	12,648	Amsterdam	Wilhelmina (b. 1880)	Queen (1898)	250,000
Hungary	.....	.....	Budapest	Nicholas von Horthy	Regent (1920)	.....
Italy	36,120,000	110,646	Rome	Victor Emmanuel III (b. 1869)	King (1900)	2,650,000
Jugo-slavia	12,000,000	158,000	Belgrad	.....	King	225,000
Lithuania	3,000,000	100,000	Vilna	A. Smetona	President (1919)	.....
Luxembourg	260,000	998	Luxembourg	Charlotte (b. 1896)	Grand Duchess (1919)	.....
Monaco	23,000	8	Monte Carlo	Albert (b. 1848)	Prince (1889)	.....
Norway	2,459,000	124,129	Christiania	Haakon VII. (b. 1872)	King (1905)	185,000
Poland	17,000,000	100,000	Warsaw	Joseph Pilsudski (b. 1867)	President (1920)	.....
Portugal	5,688,000	35,490	Lisbon	A. J. d'Almeida (b. 1865)	President	.....
Roumania	14,435,000	103,490	Bucharest	Ferdinand I. (b. 1865)	King (1914)	227,500
Russia	147,700,000	8,051,000	Moscow	Nicolai Lenine	President Council	.....
San Marino	12,000	33	San Marino	.....	Regente	.....
Spain	20,355,000	194,783	Madrid	Alfonso XIII. (b. 1886)	King (1886)	1,344,000
Sweden	5,758,000	172,876	Stockholm	Gustaf V. (b. 1858)	King (1907)	416,500
Switzerland	3,380,500	15,976	Berne	Giuseppe Motta (b. 1871)	President (1920)	3,000
Turkey	30,000,000	710,224	Constantinople	Mohammed VI. (b. 1861)	Sultan (1918)	7,500,000
Ukrania	33,000,000	300,000	Kieff	Simon Petloura	President (1919)	.....
(2) Asia						
Afghanistan	6,000,000	250,000	Kabul	Amanullah Khan (b. 1892)	Ameer (1919)	.....
Arabia	12,000,000	1,000,000	.....	.....	.....	.....
Armenia	3,000,000	80,000	.....	.....	President	.....
Bhutan	450,000	18,000	Punakha	Ugyen Wangchuk	Maharajah (1907)	.....
China (upper)	320,000,000	1,532,420	Pekin	Hsu Shih-Chang (b. 1853)	President (1918)	.....
Hedjaz	300,000	96,500	Mecca	Husein-abu-Ali (b....)	King (1916)	.....
India	315,157,000	1,802,657	Delhi	Lord Chelmsford	Viceroy	100,000
Japan (proper)	56,861,000	147,655	Tokio	Yoshihito (b. 1879)	Emperor (1912)	2,250,000
Nepal	5,600,000	54,000	Khatmandu	Shenscher Jang (b. 1906)	Maharaja (1911)	.....
Oman	550,000	82,000	Muscat	Seyyid Taimur bin Turkee (b....)	Sultan (1913)	250,000
Persia	9,575,000	628,000	Teheran	Ahmed Shah (b. 1898)	Shah (1914)	.....
Siam	8,150,000	195,000	Bangkok	Vagiravudh (b. 1880)	King (1910)	2,500,000
Turkey	See above	under	Europe	.....	.....	.....
(3) Africa						
Abyssinia	8,560,000	432,000	Adis-Ababa	Waizeru Zauditu (b. 1876)	Empress (1917)	.....
Egypt	12,569,000	363,000	Cairo	Ahmed Fuad Pasha	Sultan	.....
Liberia	2,000,000	40,000	Monrovia	C. D. B. King	President (1920)	.....
Morocco	5,000,000	219,000	Fez	Mula-ai-Yusef (b. 1875)	Sultan (1912)	.....
Union of South Africa	5,973,400	473,100	Cape Town	Viscount Buxton	Governor-General	50,000
WEST HEMISPHERE						
(1) North America						
Canada	7,206,642	3,729,665	Ottawa	Duke of Devonshire	Governor-General	50,000
Costa Rica	.....	23,000	San Jose	Julio Acosta	President (1919)	.....
Cuba	.....	44,164	Havana	Mario G. Menocal (b....)	President (1913)	25,000
Dominican Republic	795,500	19,325	San Domingo	Dr. Caravajal (b....)	President (1916)	.....
Guatemala	2,120,000	48,290	Guatemala	Carlos Herrera	President (1920)	.....
Haiti	2,500,000	10,204	Port-au-Prince	Sudre Dartiguenave (b....)	President (1915)	24,000
Honduras	606,000	46,250	Tegucigalpo	R. L. Gutierrez	President (1920)	.....
Mexico	15,160,000	765,535	Mexico	Adolfo de la Huerta	President (1920)	50,000
Nicaragua	800,000	49,200	Managua	Emiliano Chamorro	President (1917)	.....
Panama	427,000	32,380	Panama	Ernesto Lefevre (b....)	President (1920)	24,000
Salvador	1,271,000	7,325	San Salvador	Jorge Meléndez (b. 1871)	President (1919)	.....
United States	112,445,000	3,743,312	Washington	Woodrow Wilson (b. 1856)	President (1913)	75,000
(2) South America						
Argentina	8,574,000	1,153,418	Buenos Aires	Hipolito Irigoyen (b....)	President (1916)	36,000
Bolivia	2,800,000	708,195	La Paz	J. G. Guerra (b....)	President (1917)	.....
Brazil	26,543,000	3,292,000	Rio de Janeiro	Dr. Epitacio Pessoa (b....)	President (1918)	40,000
Chile	3,870,000	292,100	Santiago	J. L. Sanfuentes (b....)	President (1915)	7,000
Colombia	5,472,600	482,329	Bogota	Marco F. Suarez (b....)	President (1918)	.....
Ecuador	1,500,000	116,000	Quito	A. B. Moreno (b. 1861)	President (1916)	12,000
Paraguay	800,000	196,000	Asunción	J. P. Montero	President (1920)	9,500
Peru	4,620,000	722,461	Lima	Augusto B. Leguia	President (1919)	12,000
Uruguay	1,407,000	72,210	Montevideo	Baltasar Brum	President (1919)	36,000
Venezuela	2,848,000	398,594	Caracas	Juan V. Gomez (b....)	President (1915)	.....
Australasia						
Australia	4,935,311	2,944,628	Melbourne	R. C. Munro-Ferguson	Governor-General	50,000
New Zealand	1,162,022	103,860	Wellington	Earl of Liverpool	Governor-General	25,000

THE CONTINENT OF EUROPE

From its political and historical importance Europe has always been regarded as one of the great divisions of the earth's surface though it is not a separate and independent mass. It is, rather, a great peninsula of what is sometimes called *Eurasia* — i.e. the continent of Europe and Asia combined — that extends westward its many arms between the Arctic Ocean on the north, the Atlantic on the west, and the Mediterranean Sea on the south.

Its name seems to have been derived from the Semitic word *ereb*, meaning "the land of the setting sun," and came into use among the Greeks and Latins in very early times as *Europa*.

Outline and Extent. The most striking feature of its outline is that of its great irregularity, the deep inlets and gulfs of the ocean which penetrate its mass, and the peninsulas which run from it.

The greatest distance between its extreme north and south points — the North Cape of Norway and Cape Matapan in Greece — is about twenty-four hundred miles; and from east to west — from Cape La Roca, or the "Rock of Lisbon," to Cape Apsheron, the eastern extremity of the Caucasus range, on the Caspian — about three thousand miles.

European Gulfs and Inlets

On the north the *White Sea*, so called from the ice and snow which bind it up for more than half the year, reaches in from the Arctic Ocean. From the Atlantic, the shallow *North Sea*, or German Ocean, and the *English Channel* (called *La Manche*, or "The Sleeve," by the French) break in to separate the British Isles from the mainland; and from the former the *Skager Rak*, "the crooked and boisterous strait," leads through the *Kattegat*, the "Cat's Throat," and the "Belts" of the Danish islands, to the *Baltic*, or the "East Sea" of the Germans, and its continuations, the Gulfs of Bothnia, Finland, and Riga.

Farther southward, the stormy *Bay of Biscay*, named from the Basque province of Vizcaya, sweeps in along the northern coast of Spain, and beyond the Peninsula the narrow *Strait of Gibraltar* leads into the great *Mediterranean*, which stretches eastward for twenty-three hundred miles.

The Mediteranean and its Arms

Among the many branches of this great basin are the *Gallic Sea*, running north toward Gaul, between Spain and the islands of Sardinia and Corsica, forming the stormy Gulf of the Lion and that of Genoa; the *Tyrrhenian Sea*, between Sardinia and Italy; the *Ionian Sea* and the *Adriatic* running north from it, between Italy and the Balkan peninsula, towards the ancient seaport of Adria, perhaps the oldest in Europe.

Beyond Greece, the island-studded *Ægean* leads north to the narrow inlet of the *Dardanelles*, opening into the little Sea of Marmora, named from its marble-yielding islands, and from that by the *Bosporus* or Oxford (the canal of Constantinople), into the second great Mediterranean basin, the *Black Sea* or Euxine, with its offshoot the shallow *Sea of Azof*. The Caspian Sea forms part of the natural frontier between Europe and Asia.

The indented seaboard of Europe measures not less than sixty thousand miles.

Peninsulas of Europe

Between each of these branches of the sea there run out corresponding promontories and peninsulas of the mainland. These are most numerous on the south side, where we find the *Crimea*, *Turkey* and *Greece*, *Italy* and *Spain*, bordered by the islands of the Archipelago, by Sicily, Sardinia and Corsica, and the Baleares.

The western or Atlantic side presents the greatest peninsula, that of *Scandinavia;* and the most important island group, that of the British Isles. The Danish peninsula is remarkable as the only one in Europe, and indeed in almost any part of the world, that points northward.

Surface Characteristics

The great lowland of Europe lies toward the east, embracing the vast continental area of Russia, and sending out arms westward round the Gulf of Bothnia and the Swedish side of the Baltic, and through North Germany and Denmark, to form the lowlands of Holland and Belgium and of Western France, along the shores of the Bay of Biscay, as far as the rise of the Pyrenees.

The vast central area of the Russian lowland has almost everywhere the same character, *woods and marshes* alternating with cultivated land, affording a superfluity of grain, which is sent down by the rivers to the seaports of the Baltic and the Black Sea; but along its northern border, next the icy Arctic Sea, lie the moss-covered swamps called the *Tundras*, the soil of which is never thawed for more than a yard's depth; all its southern margin toward the Black Sea and the Caspian is a treeless *steppe*, over which at some seasons the grasses shoot up above a man's height, concealing the pasturing herds.

Remarkable Surface of Finland

Finland is one of the most remarkable regions of the great European plain; its granite floor, elevated above the sea-level probably in a recent geological period, is worn into thousands of angular lake-basins, which form a perfect network over its surface; to the sailor on the Baltic its margin presents a girdle of steep cliffs guarded by a fringe of rocky islets or skerries. The cliffy Aland Islands are detached fragments of this remarkable formation.

LOWLANDS OF WESTERN EUROPE

The eastern portions of the North German plain, as far as the Oder, have the same character, the same corn-yielding clay soil, as the adjoining lowlands in Russia; but farther west, round the capital city of Berlin, the plain becomes less fertile, in some parts sandy and bare. Beyond the Elbe, in Hanover, the *Lüneburg heath* covers a large part of the plain; next it lie the moors, marshes, and fens of Oldenburg and the borders of Holland, where cattle and horses are the wealth of the land; and beyond these the highly cultivated lowlands on each side of the Rhine delta, separated by the heaths and moors of Brabant, which run out toward the lower Scheldt like a dividing wedge between Holland and Belgium.

Passing into France, and across the broad river basins of its lowlands which open to the English Channel and the Bay of Biscay, we come upon the great wine-yielding lands, such as *Champagne* and the vineyards of the Gironde, with the corn country of Brie northeast of Paris, and of Touraine, on the Loire between these; and lastly, at the extremity of this branch of the European plain, to the *Landes* along the coast between the mouth of the Gironde and the Pyrenees, composed of sandy heaths and marshes.

ISOLATED LOWLANDS OF EUROPE

Of these, two of large extent occur in the basin of the river Danube, separated by the gorge of the "Iron Gate," formed where the Balkan and Carpathian ranges approach most closely. The upper plain, circled about on all sides by mountains, is that of *Hungary*, over which corn fields interchange with pastoral steppes well stocked with horses and cattle, sheep and swine, merging in some parts into marsh lands or into dusty sand flats. Where the plain begins to rise to the sunny hills, the Hungarian grape ripens to yield its famous wines. The lower plain of the Danube, which might be called a branch of the vast Russian lowland, is that of *Roumania*, with its far-stretching treeless heaths and pasture lands supporting great herds of cattle and horses, passing into wide reed swamps which characterize the delta of the Danube.

Corresponding to the Roumanian plain is that of *Lombardy*, perhaps the most productive region of Europe, in which the irrigated meadows may be six times mowed in the year, and where wheat, maize, and rice, and wine and dairy produce, are yielded in vast quantity.

MOUNTAINS AND HIGHLANDS

Europe presents two great mountain regions; a southern, extending along the northern border of the Mediterranean from Turkey to Spain, in continuation of the chief line of the heights of Asia; and a northern, appearing in Scandinavia and Britain, separated from the former by the western branch of the great lowland that we have been noticing.

THE ALPINE REGION

The *Alps* rise as the central mass of the southern mountain region of Europe. The many groups comprised in this series of heights which curve round the plain of Lombardy arrange themselves into three generally recognized divisions:—The Western Alps, the groups lying between the Gulf of Genoa and the Little St. Bernard Pass; the Central Alps, extending from the St. Bernard to the pass named the Stilfser Joch; and the Eastern Alps beyond this. The central mass is the highest, rising with majestic forms from deep valleys up to sharp riven peaks, high above the line of permanent snow; its wings to east and west decrease in elevation towards the Gallic Sea and the plain of the Danube on either side. All the less jagged heights are mantled in snows, from which glacier streams descend. The largest of these ice streams are the Aletsch glacier from the group of the Finsteraarhorn, and those of the frequented valley of Chamounix, descending from Mont Blanc, the monarch of the Alps.

FAMOUS ALPINE PASSES

The passes of the Alps have always had importance as the gates of traffic from North Italy to the rest of Europe; some of them, such as the two St. Bernard Passes, are under the protection of friendly monks; but railroads have now been constructed to pass the great barrier by the tunnels of Mont Cenis in the west, of St. Gothard in the center, and the Simplon farther east (opened 1906), by a line over the Brenner Pass from Innsbruck to Bozen, and by an eastern road over the Semmering from Vienna to Graz.

Southward the Alps fall steeply to the low plain of Lombardy, but a mass of lesser highlands and plateaus extends northward from them over central Europe to the border of the plain of Northern Germany.

OUTLYING SPURS OF THE ALPS

The first division is the long limestone range of the *Jura*, with its magnificent pine forests. Beyond, bordering the Rhine valley, rises the *Schwarzwald*, or Black Forest, then the *Odenwald* and the *Rhön* mountains, leading into the *Vogelsberg* and *Taunus*, and to the outlying *Harz*, the farthest north of the central European heights. Turning eastward, we reach the *Thüringerwald*, the *Fichtel Gebirge*, and the metalliferous or *Erz Gebirge;* then across the Elbe, in Saxon Switzerland, come the *Riesen Gebirge* (the Giant Range), and the *Sudetic Mountains*, extending to the Oder. Turning south again towards the Alps, the *Mährische Höhen* (the Mavorian heights) are reached, and joining with these to close in the high valley of the Upper Elbe, the high *Böhmerwald*, the forest mountain of Bohemia. Almost all the area of South Germany, including Würtemberg, Bavaria, and Bohemia, enclosed by these heights, which extend northward from the Alpine mass, is high plateau land.

HIGHLANDS OF FRANCE

Westward of these central European heights, beyond the Rhone, rises the range of the *Cevennes* in France, extending from near the Pyrenees northward through the *Forez* and *Côte d'Or* to the plateau of *Langres*, to the *Vosges* and *Hardt*.

the undulating plateau of *Ardennes* covered with beech and oak wood, and the volcanic group of the *Eifel*, skirting the Rhine valley. More centrally in France, contrasting with the adjoining long range of the Cevennes, the volcanic cones and domes of *Auvergne* rise from bare lava-covered plateaus.

PYRENEES AND SPANISH PENINSULA

Shut off from the rest of Europe by the *Pyrenees* whose high and close barrier admits easy passage only round its flanks, is the Spanish Peninsula, which, excepting in its river valleys, and along some parts of the seaboard, is a continuous highland. A number of mountain ranges, supporting broad plateaus between, traverse it from east to west. Along its northern edge the *Cantabrian* mountains prolong the high line of the Pyrenees; centrally rise the *Sierras of Guadarrama* and *Estrella;* farther south the *Sierra Morena*, and along the Mediterranean border the *Sierra Nevada* of Granada. Throughout the summer the table-lands of *Castile*, bare and treeless, are burned up by the hot sun, but through the chilly winter they are swept by violent winds. The herdsman who wears a broad-brimmed hat for protection against the excessive heat during the day, a few hours later puts on his thick warm cloak; in the same way, after the almost rainless summer, follows a cold winter with ice and snow.

MOUNTAINS OF ITALY AND THE BALKANS

The *Apennines* prolong the Maritime Alps, and run like a backbone through the peninsula of Italy. Cleared of its natural wood, and scorched by the southern sun, this range is generally dreary and barren in aspect, like a long wall, with few peaks or salient points to recall the magnificent forms of the Alps. The volcano of *Vesuvius*, the only active one in all the continental part of Europe, rises over the coast plain of Campania.

The lines of the eastern wing of the Alps are prolonged north-eastward across the Danube by the grand curve of the wooded *Carpathians* and *Transylvania Alps*, circling round the plain of Hungary. Southeastward they branch into the many ranges which support between them the confused mass of highlands of Bosnia, Herzegovina, and Montenegro, of Servia and Albania. Farther on these heights take more definite shape in the range of the *Balkan* which runs east to the Black Sea, in the mass of the *Rhodope* mountains extending south-eastward to the Ægean Sea, and in the *Pindus* range, which gives shape to Greece, and runs out into the Mediterranean in the peninsulas of the Morea.

MASS OF THE CAUCASUS

Distinct from all the rest of the southern highlands of Europe stands the huge mass of the *Caucasus*, the natural frontier of Europe on the southeast, rising like a wall from the flat isthmus between the Black Sea and the Caspian. Its close parallel chains are united by high plateaus cut into by deep narrow transverse gorges of extreme depth. Though attaining far greater heights than the Alps and reaching several thousand feet above the limit of perennial snows, the glaciers and snow-fields of the Caucasus are small and insignificant in comparison with those of the Alps. This is owing to the dryness of the region in which they stand, and the small snowfall over them.

SCANDINAVIAN MOUNTAIN GROUPS

In the north European mountain region the mass of heights which form the Scandinavian peninsula are by far the most important. These present no definite range, but are rather a collection of broad plateaus topped with moor or snow-field, cut into by long steep-walled "fiords" on the Atlantic side, and resembling the Alps in the pine woods of their slopes, in their lakes and extensive glaciers, though they are nowhere of very great altitude.

The main *field*, which is applied to most of the Scandinavian mountain groups, suggests their plateau form; the *Hardanger Field*, *Ymes Field*, and *Dovre Field*, with the *Jostedals Brae* (or ice-brae—glacier), are the most prominent of the southern heights of Norway; in the north the broken heights which run along the Atlantic and Arctic borders of the peninsula have the general name of the *Kiölen*. The heather-covered hills of Scotland—the Grampians and west coast mountains—as well as those of Cumberland and Wales farther south in Great Britain, belong to the same system as that of the Scandinavian heights.

SURFACE OF EUROPEAN ISLANDS

We have formerly noticed that almost all the European islands are high. In the Mediterranean we find the island of Crete reaching to upwards of eight thousand feet in *Mount Ida;* Sicily, with its volcano of *Etna* nine thousand six hundred and fifty-two feet; Sardinia with *Mount Gennargentu* (six thousand two hundred and ninety feet); Corsica, with *Monte Rotondo* (nine thousand and sixty-five feet); Iceland, on the border of the Arctic seas, recalling Norway in its grand fiords, rises high in its mass of volcanic jökulls (*Oræfa*, six thousand four hundred and eight feet; *Hecla*, five thousand one hundred and ten feet), covered in between with accumulated snows and glaciers; *Spitzbergen's* black peaks, which give its name, also rise high from its white glacier fields.

CHAIN OF THE URAL

Separate and distinct in character and direction from the mountains of the rest of Europe, is the long chain of the *Ural*, rich in gold, platinum, iron, and copper. It takes its name probably from the Tartar word meaning "belt," which well expresses the length and continuity of this remarkable line of heights, stretching along the eastern border of the great European plain for more than twelve hundred miles. In height, however, the Ural is insignificant. Another separated height, that of the forest-covered Valdai hills in Western Russia, would scarcely be worthy of mention among the European highlands if it did not form the water-parting of the greatest of European rivers, the Volga.

For the height of the chief mountain peaks and ranges, consult the tables on page 74 and following.

RIVERS OF EUROPE

European rivers flow in part to the Atlantic and its Mediterranean branches, partly to the Arctic Sea, and partly to the Caspian, which last belongs to the "continental" system of drainage, or the area from which no rivers escape to the open ocean.

The *Volga*, the largest European river, is the principal feeder of the Caspian, and the great highway of commerce of Central and South Russia.

The *Don*, *Dnieper*, *Dniester*, and *Danube* all flow into the Black Sea. The last-named is the second of European rivers, and forms, with its navigable tributaries, the route for traffic between Central Europe and the East.

The *Po*, the *Rhone* (the most rapid European river, though of little value for navigation), and the *Ebro* flow into the Mediterranean.

The chief rivers (all of immense importance) draining into the Atlantic, are: the *Tagus* (with its port of Lisbon), the *Douro* (Oporto), the *Gironde* (Bordeaux), the *Loire* (Nantes), and the *Mersey* (Liverpool); while of less importance are the *Guadalquiver*, *Guadiana*, *Tagus*, and *Douro* in Spain; the *Garonne*, *Loire*, and *Seine* in France. Into the North Sea flow the *Thames* (London), the *Meuse* (Rotterdam), the *Rhine* and the *Elbe*, giving uninterrupted water-way to Switzerland and into the heart of Bohemia; and into the Baltic, the rivers *Oder*, *Vistula*, *Niemen*, and *Dwina*, more or less important for purposes of transport.

On account of the great historic, political and scenic importance that attaches to the Rhine and the Danube, in addition to the fact that their courses are not confined strictly to any one country, these rivers call for more detailed descriptions. The other European rivers of importance are described in connection with the country to which they either wholly or in great part belong.

THE RHINE (*Ger.* Rhein), is probably the most famous river in the world, and, except the period between 1697 and 1871, always a purely German possession. It is usually divided into the upper, middle, and lower parts, the first lying within and along part of the boundary line of Switzerland, the second between Basel and Cologne, and the third between Cologne and the sea.

THE UPPER RHINE AND ITS SOURCE

A large number of rivulets, issuing from Swiss glaciers, unite to form the upper Rhine; but two are recognized as the principal sources—the Nearer and the Farther Rhine. The former emerges on the northeast slope of the St. Gotthard pass (seven thousand six hundred and ninety feet above sea-level), the other side of which is the cradle of the Rhone; the Farther Rhine has its origin on the flank of the Rheinwaldhorn, seven thousand two hundred and seventy feet high, not far from the Pass of Bernardino. The two mountain torrents meet at Reichenau, six miles southwest of Coire (Chur), in the Grisons canton, Switzerland, after they have descended the Nearer Rhine five thousand seven hundred and sixty-seven feet in twenty-eight miles, the Farther Rhine five thousand three hundred and forty-seven feet in twenty-seven miles.

LAKE CONSTANCE AND THE FALLS OF SCHAFFHAUSEN

After plowing its way north for forty-five miles between Switzerland and Austrian Vorarlberg, the river enters the Lake of Constance, soon after leaving which, its water a deep transparent green, it plunges down the falls of Schaffhausen, nearly seventy feet, in three leaps, and flows westward to Basel, separating Baden from Switzerland. In this stretch the river (four hundred and ninety feet wide), receives from the left the waters of the Aar. At Basel (seven hundred and forty-two feet), now two hundred and twenty-five yards wide, it wheels round to the north, and traversing an open shallow valley that separates Alsace and the Bavarian Palatinate from Baden, reaches Mainz, split into many side arms and studded with green islands. Navigation begins at Basel.

THE MIDDLE RHINE FROM BASEL TO COLOGNE

Of the numerous affluents here the largest are the navigable Neckar and the Main from the right, and the navigable Ill from the left. A little below Mainz, the Rhine (six hundred and eighty-five yards wide) is turned west by the Taunus range; but at Bingen it forces a passage through, and pursues a northwesterly direction across Rhenish Prussia, past Coblenz, Bonn, Cologne, Düsseldorf, Ruhrort, and Wesel as far as the Dutch frontier; here it is one thousand and eighty-five yards wide and thirty-six feet above sea-level.

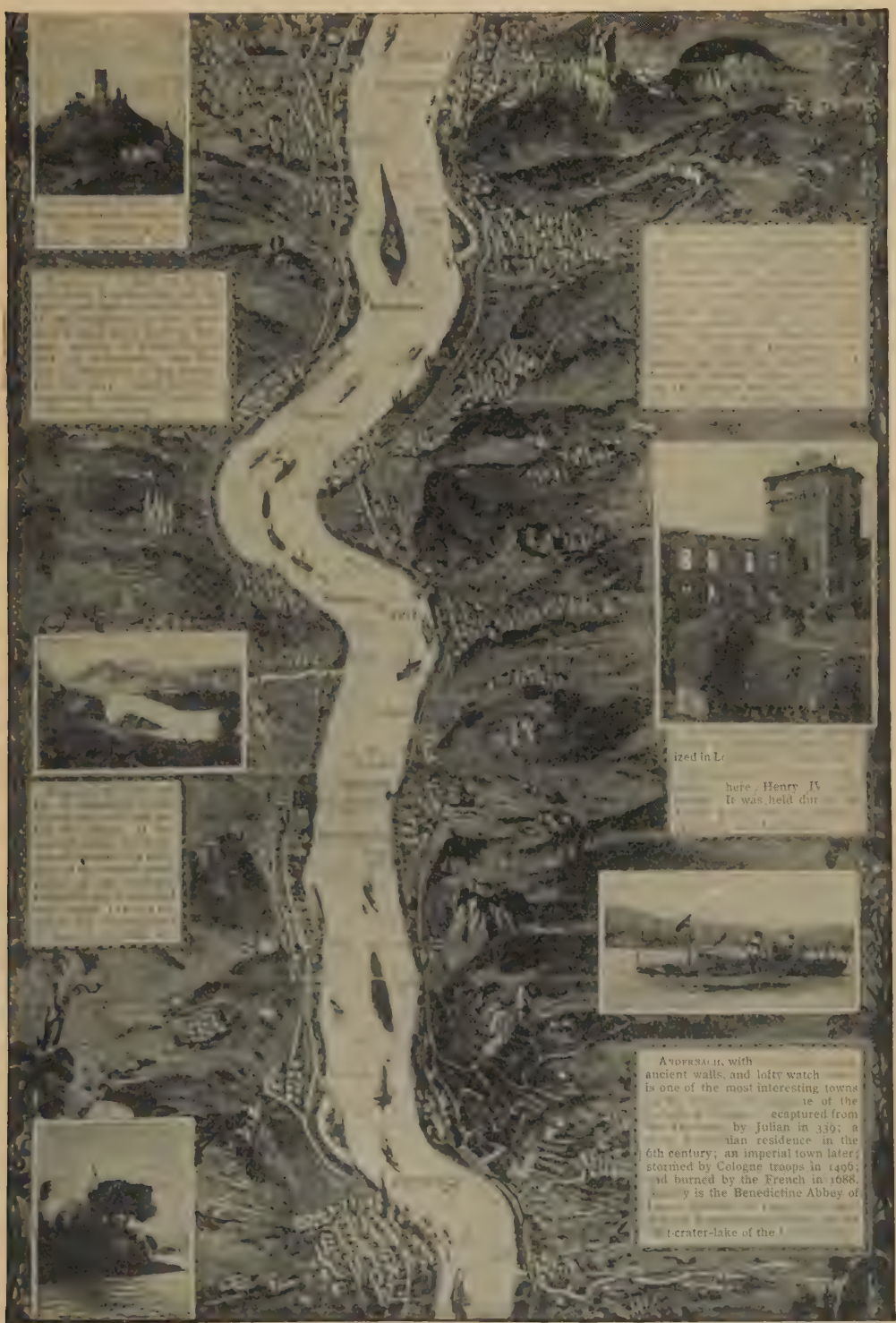
THE FAMOUS STRETCH FROM BINGEN TO BONN

The first half of this portion of the river from Bingen to Bonn is the Rhine of song and legend, the Rhine of romance, the Rhine of German patriotism. Its banks are clothed with vinyards that yield wine esteemed the world over; the rugged and fantastic crags that hem in its channel are crowned by ruined castles; the treasure of the Nibelungs rests at the bottom of the river (higher up, at Worms); the Bingerloch and the Mouse Tower of Bishop Hatto, the fortress of Ehrenbreitstein, the rock of the siren

PANORAMIC VIEW OF THE RIVER RHINE,

Starting from the important city of Cologne and ascending the river. These pages and those imme-
the course of the river, its confluents, bridges, cities, villages, castles, fortresses, historic ruins and museums,

diately following give an almost photographic panaroma of the entire Rhine valley as far as Mainz—and the general topography of the region through which river flows.

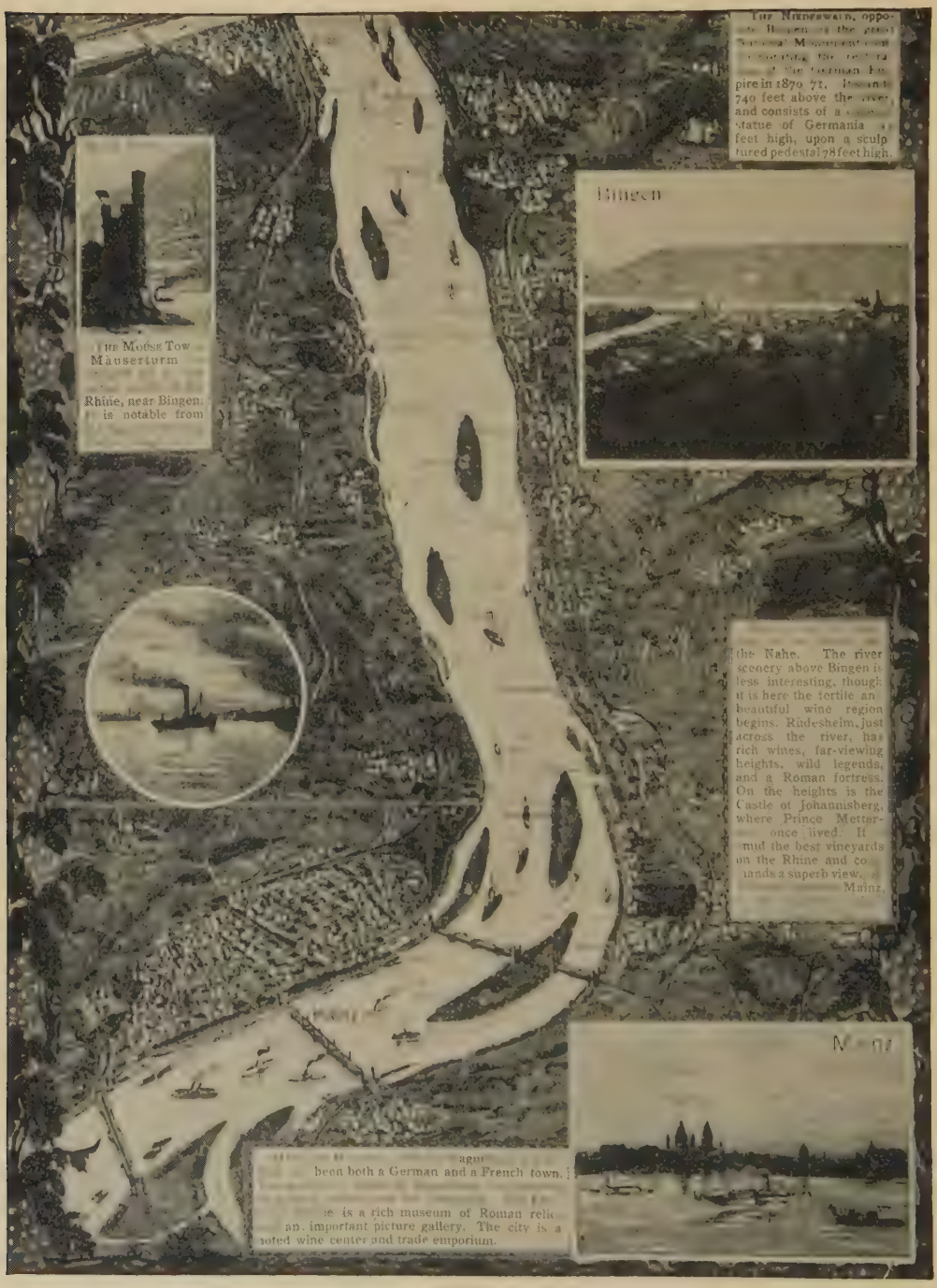


PANORAMIC VIEW OF THE RIVER RHINE—Continued

PANORAMIC VIEW OF THE RIVER RHINE—Continued

Lorelei, the commanding statue of Germania (the trophy of German victory in 1870), and innumerable other features lend interest to this, the middle course of "Father Rhine." Between Bingen and Bonn the steep rocky walls that fence in the river approach so close that road

PANORAMIC VIEW OF THE RIVER RHINE—Continued



and railway have to find their way through tunnels. The Nahe enters the Rhine at Bingen, the Moselle at Coblenz; from the right side the Lahn enters above Coblenz. Gigantic rafts are floated down from the Black Forest to Dordrecht in Holland. Below Bonn the Rhine is joined by the Sieg, Wupper, Ruhr, and Lippe from the right.

THE LOWER RHINE FROM COLOGNE TO THE SEA

At Bonn the river enters the plains, and almost immediately after passing the Netherlands frontier its delta begins. The principal arm, carrying two-thirds of the volume, flows under the name of the Waal, and later the Mermede, to Dordrecht, picking up the Maas (Meuse) from the left. At Dordrecht the river again divides for a bit, one branch, the old Maas, running out to sea; the other, the Noord, forming a loop by way of Rotterdam. The northern arm sends one branch, the Yssel, due north to the Zuider Zee; the other branch is the Lek, which runs into the Waal-Maas arm above Rotterdam.

A thin stream, called the "Winding Rhine," leaves the Lek and splits at Utrecht into two channels, of which the Old Rhine, a mere ditch, manages with the help of a canal and locks to struggle into the North Sea at Katwyk, northwest of Leyden, while the Vecht flows due north from Utrecht to the Zuider Zee near Amsterdam. In the delta the streams have to be bordered by dykes.

THE RHINE IN EARLY EUROPEAN HISTORY

The Rhine was the Romans' bulwark against the Teutonic invaders and was long a boundary between the province of Gaul and the German tribes. Under Charlemagne the Rhine valley became the focus of civilization. Except between 1697 and 1871 the Rhine was always a purely German river; at the peace of Ryswick, Alsace-Lorraine was appropriated by France, and the Rhine became part of the dividing line between France and Germany. In 1801 Napoleon incorporated the whole of the left bank with France; in 1815 the arrangement in force before 1801 was restored; and after 1871 the Rhine became once more wholly German. It has often been crossed by armies; twice by Julius Cæsar; again in the Thirty Years' war, and in the wars of Louis XIV., the Revolution, and Napoleon. Its navigation was declared free in 1868.

The Rhine is connected by canals with the rivers Danube, Rhone and Marne. There is a railway along both its banks, but a steamboat is greatly preferable for viewing the incomparable course between Cologne (Köln) and Mainz (*Fr.*, Mayence) as shown in panoramic form on preceding page. Its beauties are better displayed, also, at most points, in ascending the river than in descending it.

THE DANUBE (*Ger.*, Donau), one of the most important rivers of Europe, and next to the Volga the largest, originates in two small streams rising in the Schwarzwald, or Black Forest, in Baden, Germany, and uniting at Donaueschingen, two thousand two hundred and sixty-four feet above sea level. The Germans occupy the entire upper basin, and portions of the middle and lower; the Slavs parts of both banks of the middle course; the Magyars the central portion of the valley; and the Roumanians the lower regions.

GENERAL COURSE OF THE GERMAN DANUBE

The river flows first southeast and then northeast to Ulm, one thousand, five hundred and nineteen feet above sea level. At Regensburg it reaches its most northerly point, and from thence its course is generally southeast. Between Regensburg and Vienna the banks of the river are frequently remarkable for their romantic beauty. At Tutlingen it contracts and the hills crowd close to the banks, while ruins of castles crown almost every possible summit. The scenery is wild and beautiful until the river passes Sigmaringen.

THE AUSTRIAN DANUBE, FAMED IN HISTORY AND SONG

From Passau the Danube flows through Austria for a distance of two hundred and thirty-three miles. Closed in by mountains it flows past Linz in an unbroken stream; below, it expands and divides into many arms until it reaches the famous whirlpool near Grein, where its waters unite and flow on in one channel for forty miles through mountains and narrow passes. Between Linz and Vienna it is renowned not only for its picturesque beauty, but for the numerous historic buildings and ruins which crown its banks. The splendid Benedictine monastery of Melk, the ruins of Durrenstein, and the prison of Richard the Lion-hearted are among the most interesting.

Vienna, to defend the city against risk of inundation, the course of the Danube skirting it was, in 1868-81, diverted into an artificial channel. Similar works have been undertaken near Budapesth, in Hungary.

FROM VIENNA TO THE THE IRON GATE

After passing Vienna and Marchfeld, the river cuts through a defile formed by the lower spurs of the Alps and Carpathians and enters Hungary at the ruined castle of Theben, a little above Pressburg, the old Magyar capital. Here, again, it gives off a number of branches, forming a labyrinth of islands known as Schütten, but on emerging it flows uninterruptedly southward through wide plains interspersed with pools, marshes, and sandy wastes. The principal affluents here are the Save, the Drave, and the Theiss.

Sixty miles before entering Roumania the river passes through a succession of rapids or cataracts which it has made in cutting a passage for itself through the cross chain of hills which connect the Carpathian Mountains with the Alps. The last of these cataracts, at Old Orsova, is called the Iron Gate. Between 1878 and 1898, the Hungarian government carried through, at a cost of seven million five hundred thousand dollars, extensive engineering works at the gorges of the Iron Gates for deepening the channel and cutting a canal.

ITS JOURNEY THROUGH THE BALKAN COUNTRIES

The lower course of the Danube, in Roumania and Bulgaria, is through a flat and marshy tract, fertile but badly cultivated and thinly peopled. It forms the northern boundary of Bulgaria as far as Silistria; and from here it turns northward, skirting the Dobruja, and flows between marshy banks to Galatz, receiving on the way the Jalomitza and the Sereth. From

Galatz it flows east, and, after being joined by the Pruth from the north, it continues southeast to the Black Sea.

The delta is a vast wilderness (one thousand square miles) cut up by channels and lagoons; the farthest mouths are sixty miles apart. Two-thirds of the Danube's volume passes through the Kilia, which, like the southern or St. George branch, forms a double channel near the outlet; and so ships enter by the middle or Sulina mouth, deepened to twenty feet and straightened in 1858-1903. The steel cantilever bridge across the river at Tchernavoda is one of the great railway bridges of the world.

ITS CHIEF TOWNS AND COMMERCIAL IMPORTANCE

The principal towns on the Danube are Ratisbon, Vienna, Pressburg, Budapest, Belgrade, and Galatz. The width of the river varies considerably, and at some points the opposite shore is hardly discernible. It is first navigable at Ulm, and, thanks to various improvements, is now navigable continuously from that point to its mouth. Engineering work to this end, undertaken at Vienna, Budapest, and the Iron Gates has already been referred to. The International Danube Navigation Commission, appointed in 1856, controls the lower portion of the river, and has done much to improve navigation at the delta. Seagoing vessels of six hundred tons can now go nearly as far as the Iron Gates, while vessels of twenty-five hundred tons can go above Galatz. By means of canals the Danube is connected with the Rhine and the Elbe.

ITS PART IN HISTORY AND INTERNATIONAL POLITICS

This mighty river is exceedingly rich in historical and political associations. For a long period it formed the frontier of the Roman Empire, and along its course are still found many notable Roman remains. Traces of the great wall erected by the Emperor Trajan are to be seen on the south side of the Hungarian Danube. At Turn Severin, east of the Carpathians, a tower and several piers of Trajan's Roman bridge, a splendid piece of ancient engineering, are still standing; while his more marvelous road in the rocky Kazan defile is marked by a Roman tablet still visible.

The struggles of races and peoples in the lands bordering the Danube have been among the fiercest and strongest in all history. Fins, Kelts, Germans, Slavs, Greeks, Italians and Turks have all vied with one another in the race of conquest and possession; and even today the Balkan countries are still in the seething cauldron of new struggles for domination or independence.

The Lake Region of Europe lies round the Baltic. *Ladoga*, in Russia, is the largest fresh-water lake in Europe, as wide across as the English Channel, between Portsmouth and Cherbourg. *Onega*, and Peipus (Russia) are also of great size, as well as the lakes of Finland and Sweden, and some of those of the Alps. Chief of these are Wetter and Mœlar in Sweden; the myriad lakes of Finland; the beautiful lakes of the folds of the Alps, Geneva, Neuchatel, and Constance on the north side; and Maggiore, Como, and Garda in the Italian valleys. They will be noticed further under the countries to which they belong.

THE NATIONS OF EUROPE—THE GREAT POWERS

Of the nations of Europe it may be said that in point of rank Great Britain, Germany, France, Austria, and Russia stand first as the "five great powers." These include within their limits more than two-thirds of the entire population of Europe, and have for a long time controlled all continental questions. Second come Italy, Spain, and Sweden; in third rank are Turkey, Belgium, Holland, Denmark, and Portugal.

Another grouping on the basis of race stocks is frequently made beginning with the highest in culture, the *Germanic;* passing thence to the *Romanic;* concluding with the *Slavonic*, and the lands under the rule of the *Turks*, lowest in the scale, which are most closely connected with the Mongols of Asia. The Germanic, or Teutonic nations, include Great Britain; the German Empire; Austria-Hungary; Scandinavia (Norway, Sweden, Denmark); Holland, or the Netherlands; Switzerland, and Belgium. The Romanic nations include France; Italy; Spain; Portugal; Greece, and Roumania. The Slavonic nations, Russia in Europe; Servia, and Montenegro. The Turkish or Mongol nations, Turkey in Europe; Bulgaria.

For various reasons the first grouping is adopted in the pages following.

GREAT BRITAIN

The British Empire, Great Britain and England are often erroneously used in the popular mind for one and the same nation. In strict accuracy the British Empire consists of (1) The United Kingdom of Great Britain and Ireland; (2) India, and the British Colonies, Protectorates, and Dependencies. Great Britain proper includes only England, Scotland and Wales. What is really meant is the geographical group of the British Isles, including England, Scotland, Wales, Ireland and the adjacent islands. For here is the source of power and authority that holds together and controls this greatest of modern empires.

Geographical Features.—The British Isles belong distinctly to the mainland of Europe. If we imagine the sea level between England and Holland to fall sixty feet—the height of an ordinary house—the broad *Dogger Bank*, midway between England and Denmark, would begin to show its sands, and if a fall of two hundred feet took place one might walk dryshod across to the continent, to Belgium, Holland, or Denmark. From its shallows and banks, its stormy cross seas and frequent fogs, the navigation of the *North Sea* is dangerous; yet the traffic over it is enormous, for it is surrounded by countries, the inhabitants of which have been famous on the seas from the earliest times.

The great highways of commerce from it are *Dover Strait*, leading to the English Channel, in the south, and the stormy *Pentland Firth*, which separates Scotland from the Orkney Islands, in the north. The *English Channel*, though deeper than the North Sea, is also shallow; the enclosed *Irish Sea*, between England and Ireland, with *St. George's Channel* and the *North Channel* leading out from it to the ocean, has been scoured deeper in its central lines; but there is a width of about fifty miles of shallow sea, or "soundings," all round the islands, in the west, where they face the broad Atlantic.

Chief Islands and Divisions.—The main island of Great Britain, roughly triangular in shape, measures about six hundred miles in a straight line from its southwest corner, where the granite walls of *Land's End* and the dark serpentine cliffs of the *Lizard* run out into the Atlantic, to the northern apex, the high red sandstone rocks of *Dunnet Head*, or its companion *Duncansby Head*, where John o'Groat's House stood, on the beach of the Pentland Firth.

The base of the island, forming the north coast of the English Channel, measures only about half this distance, or three hundred and twenty miles; and the eastern side, from the chalk cliffs of the *South Foreland*, on the Strait of Dover, to the Pentland Firth, is about five hundred and forty miles long. No part of the interior of Great Britain is more distant than three or four days' walk from the sea on one side or other. In the narrower parts of the north of Scotland, indeed, where the Moray Firth runs into the land, it is an easy day's journey from the head of this inlet of the North Sea to that of one or other of the opposite sea lochs running in from the Atlantic.

The second island, *Ireland*, more rounded in general outline, measures three hundred miles from *Malin Head*, its northernmost point, to *Mizen Head*, its most southerly extremity, and two hundred miles from *Carnsore Point*, its southeastern corner nearest England, to *Erris Head*, its northwestern promontory on the Atlantic.

Smaller Islands.—The most extensive of the many island groups and islets are those which lie off the broken west coast of Scotland, the wild and rugged Outer and Inner Hebrides, of which *Lewis*, separated by the channel called the Minch, and *Skye*, *Mull*, *Islay* and *Arran*, in the inner group, are the largest. The *Orkney* group, separated from the north of Scotland by the turbulent Pentland Firth, consist of no fewer than fifty-nine rocky islets; and the *Shetlands*, forty miles farther north, comprise upwards of a hundred separate points. The high *Isle of Man*, in the middle of the Irish Sea; *Anglesey*, close to the Welsh coast, and now united to it by the famous railway tubes across the Menai Strait; and the *Isle of Wight*, "the garden of England," in the English Channel, separated from the mainland by the busy Solent, are the others of importance. The Channel Islands, of which *Jersey* and *Guernsey* are the largest, belong politically to Britain, but are physically parts of France.

Surface: Mountains and Lowlands.—In the island of Great Britain the highest portions lie generally to north and west, the lowlands to south and east.

The heather-covered Highlands, which fill the north of Scotland, are divided by the great natural passage of *Glen More*, which runs in a straight line across the island from northeast to southwest into two chief groups, the northern and central.

The northern group consists of irregularly-distributed and often almost isolated masses, separated, it may be, by deep sea-fiords, and presenting every variety of contour, from that of the round mass of *Ben Wyvis* to the steep, wall-like sides of *Suilvein* or the sharp peak of *Ben Stack*. The Central Highlands or the *Grampians*, extending from the peninsula of Cantyre northeastward to the precipitous coast of Buchan on the North Sea, are far more massive and continuous.

Ben Nevis, a huge round mass ascending abruptly from the shores of Loch Eil at the mouth of the Great Glen, is the highest mountain of the British Isles.

The Southern Highlands of Scotland are more broken, and separated by river valleys. *Mount Merrick*, in the southwest, is their highest point; the *Lowther Hills* form their central group; the *Pentlands*, *Moorfoot*, and *Lammermoor* hills their more detached portions, on the northeast.

With the Cheviot Hills, the boundary range between Scotland and England, begins the long *Pennine chain*, which reaches due south into the heart of England. *Cheviot Hill*, in the north, *Crossfell*, and *Whernside*, and the *Peak of Derby*, in the south, mark the summits and direction of the chain. To the west of the Pennine chain rises the compact circular knob of slate mountains of Cumberland, of which *Scawfell* is the summit of England proper. And corresponding to this mass, near the opposite coast, are the eastern moorlands and *wolds* of Yorkshire.

Separated from the Pennine heights by the plain of Cheshire (west of England) rise the highlands of Wales, collectively called the *Cambrian Mountains*.

Across the Bristol Channel we come to the heights of the southwestern peninsula of England, with its three groups of *Exmoor*, *Dartmoor*, with its rugged granite tors, and the *Cornish Heights*. These are the more important mountain groups of Great Britain.

Over all the south and east of England the elevations are comparatively insignificant; broad, undulating, grassy uplands, called the *South Downs* and the *Chiltern Hills*, rarely attaining more than eight hundred feet of elevation, follow the chalk formation across Southern England as far as Beachy Head on the Channel and the Foreland Cliffs on the Strait of Dover. The limestone *Cotswold Hills* between these and the Welsh Highlands rise somewhat higher.

Almost all the lowlands of Great Britain lie to the east and south. Here we find the plain of the *"New Forest"* in Hampshire and the treeless *Salisbury Plain*, the broad open *Valley of the Thames*, the *"Eastern Plain"* of Essex, Suffolk, and Norfolk, extending with rounded shores towards the North Sea; the low *"Fen District"* behind the shallow estuary of *"The Wash,"* from which many tracts have been reclaimed; the long *"Plain of York"* beyond; the valleys of the Tees and Tweed, the latter including the cultivated *"Merse,"* the march or border land of Berwickshire; the Scottish *"Lowlands"* between the Central and Southern Highlands; the *"Carse"* or alluvial plain of Gowrie, north of the Tay; *"Strathmore,"* the broad valley which extends between the Grampians and their southern outliers; the *plain of Cromarty* and the level moors of eastern Caithness farthest north of all. The only extensive lowlands on the western side of the island are the *"Vale of Severn,"* the *"Plain of Cheshire,"* between the Pennine chain and the Welsh Highlands, the lowlands round the estuary of the Solway, those of Ayrshire, and the *Valley of the Clyde*.

Crossing over to Ireland, though we find the lines of elevation running generally in the same direction as those of Great Britain, or from northeast to southwest, as shown in the peninsulas of the southwest coast, the mountains appear rather in detached clusters than in definite ranges, with shapes rather rounded than abrupt, forming a fringe round the coasts. The plateau of Antrim, which forms the precipice of *Fair Head*, the nearest point to the Scottish coast, contains the remarkable basaltic scenery of the Giants' Causeway.

Giants' Causeway.—This extensive and extraordinary assemblage of basaltic columns is in the county of Antrim, between Bengore Head and Port Rush. The name is sometimes given to the whole range of basalt cliffs along the coast, some of which reach the height of four or five hundred feet; but it is more properly restricted to a small portion of it where a platform of closely-ranged basalt columns from fifteen to thirty-six feet in height runs down into the sea in three divisions, known as the Little, the Middle, and the Grand Causeway. The last is from twenty to thirty feet wide, and stretches some nine hundred feet into the sea.

The Giants' Causeway derives its name from the legend that it was built by giants as a road which was to stretch across the sea to Scotland. There are similar formations on the west coast of Scotland, on the island of Staffa.

In the southwest are the *Mountains of Kerry*, containing *Carn Tual*, the summit of all Ireland. The only important groups that lie centrally in the island are the mountains of western Tipperary.

Within the circle of these heights, and branching out between them at many points to the sea-coast, lies the *Great Plain of Ireland*, averaging perhaps two hundred feet in elevation above the sea. The highest point between Dublin and Galway, east to west across its center, is only three hundred and twenty feet above the sea-level. Many parts of it, such as that which surrounds Lough Neagh in the north, are scarcely fifty feet in elevation.

Rivers.—England and Ireland are very bountifully watered; Scotland rather less so, as the higher mountains of Great Britain rise in the west of the island, so the water-parting line following the greatest general height lies nearer the west than the east. The longer and gentler slope of the island is to the North Sea; the shorter and steeper to the Atlantic side. Hence most of the larger rivers belong to the North Sea drainage.

The Thames (*Temz*), the most important river of Great Britain, flows southeast by east across the southern portion of the country. It rises in the Cotswold Hills and follows a course of some one hundred and ninety miles to Gravesend, the head of the estuary, where it has a width of half a mile, gradually increasing then to ten miles at the Nore lightship about thirty miles farther. By the addition of its tributaries the Colne, Leach, and Churn, it becomes navigable for barge traffic at Lechlade, where the canal to the Severn leaves. Above Oxford the stream is frequently called the Isis. At Oxford the navigability improves, and river steamers ply between Oxford and points below it as far as London. Until the Tower Bridge, in London, was built, London Bridge was the lowest in the course, and ocean-going vessels still reach the latter.

Gravesend, twenty miles lower, grew up at the spot where vessels waited the turn of the tide; a little farther the Medway, by virtue of its estuary the most important tributary, enters; just inside this is Chatham, an important naval depot. Opposite Gravesend and on the north bank is Tilbury, the terminus of modern liners. The waters from the Tilbury docks to the Nore lightship are of great strategic importance, hence there is here a station for destroyers, torpedo-boats, and gun-boats. Sheerness and Shoreham as land defenses add to this.

From London Bridge downward the Thames is lined with docks and wharves, the former being now under the Port of London authority. At Woolwich, on the south bank, eight miles below London Bridge, is the arsenal, and a little farther up the river Greenwich Observatory.

Historically, the Thames is unsurpassed by any river of the world. A slight rise surrounded by marsh on the left bank formed the first point suitable for bridging a strategic site for London, the tide giving facilities to it as a port, while yet placed well up the river for defensive purposes. Still farther up, a dominating site in the lower valley was found at Windsor for the mediæval kings. In Anglo-Saxon times the kingdoms were divided by the river, and the break in the Chiltern Hills at Goring was a check in the line of aggression.

Above London the scenery is rich and beautiful, though not romantic, the numerous islands lending a peculiar charm. The Thames is the best beloved of English rivers for those who boat for pleasure. During the summer the Thames is a favorite holiday resort, house-boats being frequently the temporary homes of pleasure-seekers;

and regattas are held at Henley, Kingston, and other places. For boat-racing, it divides the honors with the Tyne. The Thames watermen are renowned in song and story. Since Spencer's days "the silver-streaming Thames" has been sung by England's poets; Herrick calls it "Silver-footed Thamesis;" Denham's apostrophe is famous; and Pope has word-painted much of the scenery of its banks.

OTHER BRITISH RIVERS.—The next longest river to northward is the *Great Ouse*, navigable from the west for ninety miles to Bedford; then we come to the group of rivers which water the long plain of York, and unite in the estuary of the Humber, including the *Trent* from the south, navigable one hundred and five miles to Burton; the *Yorkshire Ouse*, navigable forty-five miles to the city of York, with its main tributary the *Derwent*. Farther north are the *Tees* and *Wear*, and the busy *Tyne*. Passing into Scotland, we reach the *Tweed*, valuable for its fisheries, but unnavigable; the *Forth*, winding in links through the fertile lowland, navigable to Stirling; the *Tay*, navigable to Perth; the rapid *Dee* and *Spey* from the Grampians, and the *Ness* from the lakes of Glenmore.

On the western or Atlantic side of Britain, the largest river, the second in drainage area in the island, is the *Severn*, drawing its upper tributaries from the Welsh mountains, and its chief lower affluent, the navigable *Avon*, from England, curving round to the British Channel; it is navigable to Welshpool, one hundred and twenty miles from its mouth. The *Mersey*, though a short river, forms one of the most important estuaries of the island, the "Liverpool Channel." Scarcely less valuable in this respect is the lower *Clyde*, the most important commercial river of Scotland, navigable to Glasgow, and forming in its upper valley the largest falls in the island.

Almost all the river estuaries of Britain are great highways of commerce; the Solway Firth, between England and Scotland on the west coast, is the most important exception, its swift and strong tides, rushing in over the sands so fast that a galloping horseman can scarcely escape from them, being exceedingly dangerous to shipping. Besides these estuaries many natural harbors lie round the coast. Such are the sheltered Solent and Portsmouth harbor behind the Isle of Wight, Plymouth Sound farther west, and Milford Haven on the south coast of Wales, unsurpassed perhaps in the world as a deep and spacious harbor thoroughly sheltered from all winds.

British Lakes.—The lakes of South Britain are comparatively few and small. *Bala Lake*, only four miles long, is the largest in the Welsh Highlands; in England the only considerable group is that which clusters round the knot of mountains in Cumberland, known through the rare interest that has been added to this district by the group of illustrious poets who made it their home about the beginning of the nineteenth century.

English Lake District.—Within this area are grouped as many as sixteen lakes or *meres*, besides innumerable mountain *tarns* and streams. The district extends about thirty miles from north to south by about twenty-five from east to west, and contains within its compass the utmost variety and wealth of natural scenery, soft and graceful beauty ever alternating closely with grandeur and sublimity.

Windermere, the largest of the lakes (ten and one-half miles by one mile), lies in the southeast corner of the district and is connected with Rydal Water, Grasmere, Elther Water, and Esthwaite. To the west rises the Scawfell range, terminating in the Old Man of Coniston, which rises above Coniston Water, and to the east of the Scawfell range lies Wastwater (three miles long), the deepest of all the lakes. In the northeast is Ullswater, with the sequestered Hawes Water to the southeast. To the west of Helvellyn is Thirlmere, which is the reservoir for the water supply of Manchester, dammed in 1890-1894. The river Derwent, rising in the Scawfell range, flows north through Borrowdale and forms Bassenthwaite and Derwentwater, the most beautiful of the lakes. Westward from Borrowdale opens a valley in which lie Buttermere and Crummock Water, and between these and the Derwent valley is Ennerdale Water. There are several waterfalls, the chief, perhaps, being Lodore, near Derwentwater. Near Derwentwater lies Keswick, the chief town of the district, while Ambleside and Bowness (Windermere) and Hawkshead (Esthwaite) are other places of importance.

Of the lake school of poets, Wordsworth was the acknowledged head and founder, and his home for sixty years was in the Lake District. Southey, Samuel Taylor Coleridge, and De Quincey were the chief of the group, and Shelley, Scott, Carlyle, Mrs. Hemans, Matthew Arnold, Edward Fitzgerald, Tennyson, Gray, and Charles Lamb, although not directly associated with the school, were connected with the district.

Scotch Lakes.—Scotland abounds in lakes in all three Highland districts, and their number increases towards the north. *Loch Lomond*, twenty-four miles long, in the largest in Britain, *Loch Awe*, *Loch Tay*, *Loch Rannoch*, and *Loch Ericht*, may be mentioned as the largest of those in the Grampian valleys. *Loch Ness*, twenty-four miles long and eight hundred feet deep, with *Loch Oich* and *Loch Lochy*, fills the deep trench of the Great Glen between the Grampians and the Northern Highlands; *Loch Shin*, twenty miles long and only one mile broad, and *Loch Maree*, are the largest of the Northern Highland region. On the western watershed of the Northern Highlands, however, lakes are so thickly sown that hundreds may be counted from a mountain top, and the Outer Hebrides are covered with a perfect network of them.

Irish Rivers and Lakes.—In Ireland, in contrast to Britain, the watersheds are more evenly divided toward all points of the compass; the greatest drainage, however, is westward to the Atlantic. On this side we find the largest river, the *Shannon*, one hundred and sixty miles long, draining an area second only to that of the Thames in extent, and affording a navigable highway over the central plain almost up to its source. The *Erne* is another large river of the western drainage of Ireland. Flowing northward we find the *Foyle*, and the *Bann* passing through Lough Neagh, and navigable for fifty-five miles. On the eastern watershed the *Liffey*, from the Wicklow Mountains, is the most important stream; the *Barrow*, navigable to Athy, seventy miles from its fine estuary of Waterford Harbor, receiving near its mouth the almost equally important *Nore* and *Suir*, is the chief river of the southern drainage; the *Blackwater*, affording twenty-two miles of navigation, and the *Lee*, flowing to Cork (Queenstown) Harbor, are the other notable rivers of this slope.

The lakes of Ireland, in contrast to those of Britain, belong rather to the plain than to the mountain regions. *Lough Neagh*, in the basin of the Bann in the north, is the largest of all in the British Islands, one hundred and fifty-four square miles in area, twenty miles in length. The lakes of the *Erne*, upper and lower, stand next in size; *Loughs Corrib* and *Mask* in Connaught, joined by a subterranean channel, are the largest in the west. The Shannon has three large expansions, *Loughs Allen*, *Ree*, and *Derg*. Most famous for their scenery, however, are the much smaller highland *Lakes of Killarney*, embosomed

in the southwestern mountains of Kerry, and considered the finest in Great Britain.

Climate.—Their maritime situation has a favorable effect on the climate of the British Isles, making it milder and more equable than that of continental countries in the same latitude.

Peoples of the British Isles.—During the four centuries in which the Romans held the lowlands of South Britain, many of the native British tribes became Romanized, but the Celtic peoples of the mountain regions of Wales, the Scottish Highlands, and of the west of Ireland, have retained their language and more or less pure blood to the present day. After the fall of the Roman power the invading Anglo-Saxons and Jutes conquered the island, and to their strong Germanic element followed that of the brilliant Normans, or Northmen who had settled in Normandy, and who had there adopted the religion, language, and manners of the French.

Thus the population of these islands is a mixed Celtic, Germanic, and Romanic one, all its elements being more thoroughly amalgamated in the populous lowlands of Britain, the Celtic remaining purer in the highland regions, which are more difficult of access. In Ireland the Teutonic element prevails along the eastern margin; thence towards the western mountains the transition is gradual to the pure Celtic.

Religion.—In religion, rather more than half the population of England claims membership in the Church of England; the most prominent other bodies being the Wesleyan Methodists, the Independents, and Baptists. About a twentieth part of the population is Roman Catholic.

Cities.—The three largest cities in Wales are Cardiff, Rhondda, and Merthyr Tydfil. The capital of England and of the British Empire is London. The cities next in size (in order of population) are Liverpool, Manchester and Salford, Birmingham, Leeds, Sheffield, Bristol, Bradford, Nottingham, and Hull.

The capital of Scotland is Edinburgh. Glasgow is the industrial metropolis, followed by Dundee, and Aberdeen. After these come, in order of population, Paisley, Leith, Greenock, Coatbridge, Kilmarnock, Kirkcaldy, Perth, Hamilton, Motherwell, and Falkirk.

The capital of Ireland is Dublin; the other chief towns are Belfast, Cork, Limerick, and Londonderry.

There are numerous other cities, towns, villages and districts notable for industrial, educational, historical, literary, or other associations.

THE VICTORIA EMBANKMENT, LONDON, WITH THE THAMES IN THE FOREGROUND

LONDON, the capital of the British Empire and the second largest city in the world, is situated in the southeast of England on both sides of the River Thames, which winds through it from west to east. The river is crossed by numerous bridges and is deep enough to allow large vessels to come up to London Bridge, the lowest of these (except the movable Tower Bridge), where it is two hundred and sixty-six yards wide. London may be said to stretch from east to west about fourteen miles, from north to south about ten.

The area embraced by the Metropolitan and City police districts, including all parishes within fifteen miles of Charing Cross, is spoken of as Greater London. The population of London roughly equals that of Scotland, Holland, Portugal or Sweden. Under the Act of 1899 London includes the municipal boroughs of Battersea, Bermondsey, Bethnal Green, Camberwell, Chelsea, Deptford, Finsbury, Fulham, Greenwich, Hackney, Hammersmith, Hamstead, Holborn, Islington, Kensington, Lambeth, Lewisham, Paddington, Poplar, St. Marylebone, St. Pancras, Shoreditch, Stoke Newington, Wandsworth, Westminster and Woolwich.

General Features.—The greater portion of London lies on the north side of the Thames, in the counties of Middlesex and Essex, mainly the former, on a site gradually rising from the river, and marked by several inequalities of no great height, except in the northern suburbs, where the elevation of four hundred and thirty feet is reached; on the opposite bank, in the county of Surrey and partly in Kent, the more densely built parts cover an extensive and nearly uniform flat, in some places below the level of the highest tides, while the outskirts are mostly elevated.

The nucleus of London was formed by what is still distinctively the City of London, situated in the heart of the metropolis on the north bank of the Thames. The City is a separate municipality, having a civic corporation of its own, at its head being the Lord-mayor of London. The City occupies only six hundred and seventy-one acres, and has a resident population of only twenty-seven thousand.

Westminster, another portion of old London, associated with the sovereigns, the parliaments, and the supreme courts of justice of England for over eight hundred years, borders with the City

PARLIAMENT BUILDINGS, LONDON

on the west; while across the river from the city lies the ancient quarter of Southwark, or "The Borough." Besides these, London consists of a great number of well-defined quarters or districts, as well as many minor districts, the names of which are familiar to the outside world, such as Whitechapel, Spitalfields, Pimlico, Bloomsbury, Bermondsey, Belgravia, etc. Another loose division of London is into the West End or fashionable quarter, the residence of the wealthy, and the East End, the great seat of trade and manufactures.

The financial and business houses of the city are principally located to the east of St. Paul's; the galleries, theaters, and places of amusement between St. Paul's and St. James's Park; the parks and residences of the nobility upon the western margin of the city. The railway stations are, with few exceptions, in the suburbs.

London, on the whole, may be called a well-built city, brick being the material generally employed, though many public and other edifices are built of stone. In some streets the brick fronts are made to imitate stone by being coated with cement. The streets are generally well kept and well paved and lighted, but, except in some of the more recent quarters, the general appearance of London is not attractive, much of the effect of the fine buildings being lost by overcrowding and the want of fitting sites.

What generally most strikes a stranger in London is its immense size, which can only be grasped by actually traveling about, or by obtaining a view from some elevation, as Primrose Hill in the northwest, or the dome of St. Paul's Cathedral near the center, the most conspicuous building in the metropolis. Other striking and also attractive features of London are the parks, especially Hyde Park and Regent's Park, so valuable as breathing spaces; and the handsome and massive stone embankments along the Thames, forming wide roadways and promenades bordered by trees for long distances.

As the capital of the British Empire, London is from time to time the residence of the sovereign and court. It contains the buildings for the accommodation of parliament and all the great government departments. It is the chief intellectual center of Britain, and is equally great as a center of commerce, banking and finance generally.

Main Streets.—Although in the different districts of London, with the exception of the parts most recently built, there are numerous narrow and crooked streets, yet the whole extent of the metropolis is well united by trunk lines of streets in the principal directions, which render it comparatively easy for a stranger to find his way from one district to another. Picadilly and Pall Mall; the Strand and its continuation Fleet Street, Oxford Street and its continuations, Holborn, Holborn Viaduct, and Cheapside eastward and Bayswater Road, Notting Hill High Street, and Holland Park Avenue westward, are among noteworthy streets running east and west; while of those running north and south, Regent Street, perhaps the handsomest street in London, and the location of fashionable shops, is the chief. Edgware Road, with its continuations, is an important thoroughfare running northwest. Kingsway and Aldwych, connecting Holborn with the Strand, were opened in 1905.

Many of the streets are closely associated with special trades, industries, pursuits, etc. Thus Bond Street is associated with jewelers, Oxford Street and Regent Street with milliners, the Burlington Arcade with fashionable haberdashers, Fleet Street with newspapers, Northumberland Avenue and the Strand with hotels, Long Acre with carriage builders, Shaftesbury Avenue with theaters, while Pall Mall is the especial center of clubland. Booksellers' Row and the Lowther Arcade in the Strand, famous respectively for second-hand book shops and for toy shops, have both disappeared quite recently. The Thames Embankment on the north or Middlesex side, known as the Victoria Embankment, also forms a magnificent thoroughfare, adorned by important buildings, and at different points with ornamental grounds and statues.

Bridges.—A number of magnificent bridges cross the Thames. The lowest is the Tower Bridge, a "bascule" bridge opening by machinery so as to let ships pass through. The others most remarkable in upward order (exclusive of railway bridges) are London Bridge, nine hundred feet long, and built of Aberdeen granite; Southwark Bridge, and Blackfriars' Bridge, all connecting the city with Southwark; Waterloo Bridge, one thousand three hundred and eighty feet long, consisting of nine elliptical arches of Aberdeen granite; Westminster Bridge, an elegant structure of iron, one thousand two hundred feet long, crossing the river from Westminster to Lambeth; Vauxhall Bridge (rebuilding completed in 1906), carrying an electric railway; Putney Bridge, and Hammersmith Bridge. A great traffic passes under the river in tunnels, some for

electric railways. The old Thames Tunnel, two miles below London Bridge, now contains a railway. The great Blackwall Tunnel, farther down, is for general traffic.

PARKS AND SQUARES.—The chief parks are in the western portion of the metropolis, the largest being Hyde Park and Regent's Park, which, together with St. James's Park and the Green Parks, are royal parks. The most fashionable is Hyde Park, containing about four hundred acres. It is surrounded by a carriage-drive two and one-half miles long, has some fine old trees, large stretches of grass, and contains a handsome sheet of water sadly misnamed the Serpentine River. Kensington Gardens (three hundred and sixty acres), with which Hyde Park communicates at several points, are well wooded and finely laid out. St. James's Park, eighty-three acres, and the Green Park, seventy-one acres in extent, adjoin Hyde Park on the southeast. Regent's Park, in the northwest of London, north of Hyde Park, containing the gardens of the Zoological Society and those of the Royal Botanic Society, covers an area of four hundred and seventy acres. The Zoological Gardens contain the largest collection of living animals of all kinds in the world. Adjoining Regent's Park to the north is Primrose Hill. There are, besides, Victoria Park in the northeast of London, Hamstead Heath in the northwest, the happy hunting-ground of the toilers of the city on "bank holidays." Battersea Park in the southwest, West Ham Park in the extreme east, Greenwich Park at Greenwich, etc.

Of the squares the most central and noteworthy is Trafalgar Square, with Charing Cross adjoining. Most of the squares possess gardens, some public, such as Leicester Square, others private, as Grosvenor Square, Russell Square, Bedford Square, Tavistock Square, etc.

MONUMENTS—Among the public monuments are "The Monument" on Fish Street Hill, London Bridge, a fluted Doric column two hundred and two feet high, erected in 1677 in commemoration of the great fire of London; the York Column, in Waterloo Place, one hundred and twenty-four feet high; the Guards' Memorial (those who fell in Crimea), same place; the Nelson Column, in Trafalgar Square, one hundred and seventy-six and one-half feet high, with four colossal lions by Landseer at its base; the national memorial to Prince Albert in Hyde Park, probably one of the finest monuments in Europe, being a Gothic structure one hundred and seventy-six feet high, with a colossal statue of the prince seated under a lofty canopy; Cleopatra's Needle on the Thames Embankment; a handsome modern "cross" at Charing Cross; and numerous statues of public men. The Queen Victoria Memorial at Buckingham Palace, on a grand scale, was designed by Sir Aston Webb, R. A.

CLEOPATRA'S NEEDLE, LONDON

PUBLIC BUILDINGS.—Among the royal palaces are St. James's, a brick building erected by Henry VIII.; Buckingham Palace, the King's London residence, built by George IV.; Marlborough House, the residence of the Prince and Princess of Wales; Kensington Palace, a plain brick building, the birthplace of Queen Victoria. These are all in the west of London.

Lambeth Palace, the residence of the Archbishop of Canterbury, is situated on the Surrey side of the river, while Fulham Palace, the residence of the Bishop of London, is in Fulham, near Putney Bridge.

On the north bank of the Thames stand the Houses of Parliament, a magnificent structure in the Tudor Gothic style, with two lofty towers. The buildings cover about eight acres, and cost fifteen million dollars. Westminster Hall, adjacent to the Houses of Parliament, a noble old pile built by William Rufus, was formerly the place in which the Supreme Courts of Justice sat, but is now merely a promenade for members of parliament.

In and near Whitehall in the same quarter are the government offices, comprising the Foreign, Home, Colonial, and India Offices, the new War Office, Horse Guards and Admiralty.

Somerset House, which contains some of the public offices, is in the Strand. The Postoffice in the city occupies spacious and handsome buildings. New Postoffice buildings are on the former site of Christ's Hospital, the king having laid the foundation stone in 1905.

Adjoining the city on the east is the Tower, the ancient citadel of London, which occupies an area of twelve acres on the banks of the Thames. The most ancient part is the White Tower, erected about 1078 for William the Conqueror.

Other noteworthy buildings are the new Law Courts, a Gothic building at the junction of the Strand and Fleet Street; the Bank of England; the Royal Exchange; the Mansion House, the official residence of the lord-mayor; the Guildhall, the seat of the municipal government of the city; and the four Inns of Court; and Inner and Middle Temple, Lincoln's Inn; and Gray's Inn.

CHURCHES.—Among the churches the chief is St. Paul's Cathedral, completed in 1710 by Sir Christopher Wren. It is situated in the City, occupies the summit of Ludgate Hill, and is a classic building, five hundred and ten feet in length, with a dome four hundred feet in height.

Westminster Abbey, one of the finest specimens of the pointed style in Great Britain, dates from the reign of Henry III. and Edward I. It adjoins the Houses of Parliament, is five hundred and thirty-one feet long, including Henry VII.'s chapel, and two hundred and three feet wide at the transepts. Here the kings and queens of England have been crowned, from Edward the Confessor to George V. In the south transept are the tombs and monuments of great poets from Chaucer downward, whence it is called "Poet's Corner"; and in other parts are numerous sculptured monuments to sovereigns, statesmen, warriors, philosophers, divines, patriots, and others, many of whom are interred within its walls. Among many old churches are St. Bartholomew's in West Smithfield; the Chapel Royal, Savoy; St. Andrew's, Undershaft; St.

Giles, Cripplegate; St. Margaret's, Westminster; St. Stephen's, Walbrook; the Temple Church, Bow Church, St. Bride's in Fleet Street. The Roman Catholic Cathedrals at Westminster and in Southwark should also be mentioned.

PLACES OF AMUSEMENT.—These are naturally exceedingly numerous. Among the theaters may be mentioned: Covent Garden, the home of opera; Drury Lane, identified with melodrama and pantomime; His Majesty's, famous for its efforts in the cause of the higher drama; the Haymarket, St. James's, Criterion, Wyndham's New, Duke of York's, Garrick, Court, and others, for comedy; the Gaiety, Daly's, Lyric, Prince of Wales's, Savoy, and Vaudeville for musical comedy and comic opera. The "music-hall" is equally conspicuous among London's places of amusement, variety entertainments being given at the Alhambra, Empire, Palace, Coliseum, Hippodrome, Lyceum, and a host of others. Among the more dignified concert halls may be mentioned the Royal Albert Hall (capable of holding an audience of eight thousand persons), Queen's Hall, and Crystal Palace.

MUSEUMS.—The British Museum, the great national collection, in a very central position, is the principal one. It contains an immense collection of books, manuscripts, engravings, drawings, sculptures, coins, etc.

The South Kensington Museum is a capacious series of buildings containing valuable collections in science and the fine and decorative arts, and there is a branch museum from it in Bethnal Green, in the East End. The very extensive natural history department of the British Museum occupies a fine Romanesque building at South Kensington. The India and the Patent Museums are also at South Kensington, and here was built the Imperial Institute, partly intended as a museum of home and colonial products, but now also accommodating the University of London.

The Soane Museum contains many valuable objects of art. The chief picture-galleries are the National Gallery, in Trafalgar Square, the National Gallery of British Art (known as the Tate Gallery), the collection in the Victoria and Albert Museum, and the National Portrait Gallery. Mention must also be made of the Wallace Collection, at Hertford House, Manchester Square, a magnificent collection of pictures, sculpture and objects of art, bequeathed to the nation by the widow of Sir Richard Wallace in 1897.

The chief libraries are the British Museum, Lambeth Palace library, the Guildhall library, Sion College library, the London library, London Institution library. Many free libraries have recently been established.

SHIPPING.—The port of London has been for many years the greatest in the world The control and management of the business of the port was transferred in March, 1909, from the Thames Conservancy to the Port of London Authority. This new body controls the river from Teddington to Warden Point, fifty-one miles east of London Bridge. It also took over the India, Millwall, and Surrey Commercial docks. The total cost of the transfer was one hundred and twelve million dollars.

ST. PAUL'S CATHEDRAL, LONDON

ITS COSMOPOLITAN POPULATION.—There are in London nearly 60,000 persons of Scottish birth and over 60,000 of Irish birth. Of 150,000 foreigners, 40,000 are Russians (including Jews), with 16,000 Russian Poles, 30,000 Germans, 12,000 French, 11,000 Italians, 6,000 Austrians, 6,000 Americans (U. S.), 4,500 Dutch, 45,000 Swiss, 2,500 Belgians, 1,800 Swedes, 1,000 Norwegians, and 1,000 Danes.

COMMERCIAL AND INDUSTRIAL CENTERS

In England and Wales.—*Hull*, the *Tyne Ports* (Newcastle, Gateshead, and Shields), and *Sunderland*, with London, form the great outlets of the east of England. *Liverpool* (with Birkenhead), ranking with London in maritime importance, and *Bristol*, are the great outlets and seats of commerce in the west of England, as *Southhampton* and *Plymouth* on the Channel are in the south.

The most important of all the textile industries of England is that of cotton, which has centered itself in *Manchester* and in its satellite cities on the coalfield of Lancashire and Cheshire (Preston, Blackburn, Oldham, Wigan, Bury, Rochdale, Bolton, Stockport, Macclesfield), drawing a dense population round these centers, with their thousands of factories, fed with raw material from abroad, and relieved of their manufactured products by Liverpool and the port of Manchester.

The woolen manufactories, next in importance, are on the opposite side of the Pennine chain, in the great towns of *Leeds* and *Bradford*, as well as in Halifax, Huddersfield, Wakefield, and Dewsbury, clustering round these. Linen manufactures center at *Barnsley*, farther south, also on this Yorkshire coalfield. Three outlying woolen manufacturing centers may be noted; these are *Leicester*, in a famous sheep-raising district, and *Kidderminster*, noted for its carpets, *Stroud*, *Bradford*, and other towns in the west of England, noted for the quality of their cloth. Newtown, in Montgomeryshire, is the center of the Welsh flannel trade.

Hardwares have two great points of production—the one round *Sheffield*, on the Yorkshire coal and iron field, the other round *Birmingham* and the towns on the South Stafford coal and iron field (Wolverhampton, Wednesbury, Bilston, Dudley, Walsall), called the "Black Country" because large parts of it are so completely cut up with collieries and ironworks that no cultivation exists.

In North Staffordshire, between the iron and the cotton manufacturing regions, lies the "Potteries," a district which by supplying coal is able to maintain its staple industry. *Stoke-upon-Trent* is the center of the cluster of Pottery towns (Burslem, Longton, Hanley, Tunstall), all connected by lines of busy hamlets. Worcester, on the Severn, is also celebrated for its pottery.

English silk manufacturers give importance to three separate districts, those round *Congleton* and *Macclesfield*, in Cheshire; *Derby;* and *Coventry*, in Warwickshire. *Nottingham* town combines silk and cotton manufactures in hosiery and lace work. *Stafford* town supplies boots and shoes to all the manufacturing towns which lie round it.

The coal trade of North England centers in the *Tyne Ports* and Sunderland, which are also famous for their iron, ships and engines, and their chemical works. The South Wales iron and coal field has its heart in *Merthyr Tydfil*, one of the largest towns of Wales; *Cardiff*, with fine docks and iron shipbuilding yards, besides its large coal export trade; *Swansea* is the headquarters of copper and tin smelting, from ores brought thither from the most distant parts of the world; *Milford Haven* aspires to becoming the rival of Liverpool in the trade with America.

Among the few large towns besides London which lie outside the manufacturing and mining region of England, may be noted *Norwich*, in agricultural Norfolk, a seat of manufactures of the most various kind, introduced by about four thousand Flemings who fled thither in Queen Elizabeth's reign.

In Scotland.—On the Scottish coal and iron field, *Glasgow*, favored by its position on the estuary of the Clyde, has risen to be at once the great commercial and manufacturing center of the country, carrying on a large trade with all parts of the world, in manufacturing cottons and machinery, and in building ships. A number of manufacturing towns (Paisley, noted for its shawls; Greenock, for its sugar-refining; Dumbarton, for its iron ships; Airdrie, in the midst of the collieries and iron works) have risen round Glasgow over the Scottish coalfield. *Leith*, the port of Edinburgh, is mainly engaged in the Baltic grain trade; *Dundee*, on the estuary of the Tay, owes much of its prosperity to its jute and hemp factories, and to its Greenland whaling and sealing trade.

In Ireland.—Owing to its poverty in coal and iron, the manufactures of Ireland have not attained an extent at all comparable with those of Britain. Its only extensive manufacturing district is that which lies round *Belfast*, in the northeast, where the flax, grown largely in the north of the country, is made into linen. The linen district extends to *Armagh*, on the west, and *Coleraine*, in the north.

Dublin, the capital, is noted for its poplins, stout, and whiskey; its quays afford excellent accommodation for shipping, and it takes the lead in the foreign trade of Ireland.

Cork, with its fine harbor the "Cove of Cork," or Queenstown, in the south; *Limerick*, on the Shannon; *Galway*, the port of the west; *Londonderry*, in the north, are the other important centers of population in Ireland.

EDUCATIONAL, HISTORICAL AND LITERARY CENTERS

Edinburgh (ed-in-bo-ro; *Edwin's burgh*), the metropolis of Scotland, grew up originally beneath the protecting walls of its castle, and is not a manufacturing town, but derives its importance mainly from the law courts, its university and schools, and its printing and publishing trade. It is situated upon two ridges of ground, divided by a deep, narrow valley, formerly a morass, now made into a public park, through which the railways pass. To the north of this park is the New Town, composed of modern and elegant buildings—the principal street, Princes Street, bordering upon and overlooking the park. The principal hotels are on the opposite of Princes Street. The railway stations are in the valley. To the south lies the ridge of the Old Town, terminating, to the west in a rocky bluff, upon which stands the Castle in the heart of the city. The Old Town is the historic part of the city, the New being quite modern. The first Scottish Parliament was convened here by Alex. II., 1215.

The principal places of interest are Edinburgh Castle, Holyrood Abbey and Calton Hill. Among the objects of less interest are the house of John Knox, High Street; St. Giles Church; Allan Ramsay's Theater, the favorite resort of Burns; the Black Turnpike, the prison of Queen Mary, near the Iron Church; and the Heart of Midlothian, the site of an old prison. Annie Laurie was married in Iron Church two hundred and fifty years ago. John Knox is buried in the paved court between the Parliament House and St. Giles; marked by the letters J. K. in the pavement.

THE CASTLE, stands on a precipitous rock about three hundred feet above the valley, accessible only from the east side. It is an extensive mass, of which the oldest portion—and the oldest building in the city—is St. Margaret's Chapel, the private oratory of the Saxon Princess Margaret, queen of Malcolm Canmore. Another portion is a lofty range of old buildings, in a small apartment of which Queen Mary gave birth to James VI. in 1566; while in an adjoining apartment are kept the ancient regalia of Scotland. Here, also, is the old Parliament Hall, restored in 1888-1889. The castle as a fortress contains accommodation for two thousand soldiers, and the armory space for thirty thousand stand of arms. An old piece of ordnance built of staves of malleable iron, cask fashion, and known as *Mons Meg*, stands conspicuous in an open area.

HOLYROOD PALACE AND ABBEY was founded by King David I., who is said to have been saved from the horns of a stag, driven to bay near this spot, by a luminous cross in the sky. In the northwest angle of the building are the apartments which were occupied by Mary, Queen of Scots, nearly in the same state in which they were left by that unfortunate princess.

CALTON HILL (*call-ton*) is at the eastern end of Princes Street and has an altitude of about three hundred and fifty feet. Upon the hill, adjacent to the stairs, is Dugald Stewart's monument at the left; to the north is the Old Observatory, and the New Observatory with a small dome. To the south is Nelson's monument, one

hundred and two feet high, surmounted by a time-ball. The unfinished colonnade is a part of a structure in honor of Waterloo, intended to be a copy of the Parthenon at Athens. The foundation was laid 1822, but, proving too costly, the project was abandoned.

VIEW OF EDINBURGH FROM THE CASTLE

The view from the summit of this hill is scarcely to be surpassed. To the north is what may be called New Edinburgh, extending toward Granton and the port of Leith. Across the Forth, is Fifeshire. Following down the Forth, is first, the islands of Inch Keith, Portobello, Bass Rock, and the Isle of May, farther at sea. Toward the south and west the Burns monument; Holyrood immediately below; Salisbury Craig and south, Arthur's Seat, eight hundred and twenty feet high; thence to the north the Old Town, commanded by the frowning Castle.

Oxford, capital of Oxford county, and seat of one of the most celebrated universities in the world, is situated about fifty miles northwest of London, on a gentle acclivity between the Cherwell and the Thames, here called the Isis. Oxford, as a city of towers and spires, of fine collegiate buildings, old and new, of gardens, groves, and avenues of trees, is unique in England.

Of the university buildings the most remarkable are Christ's Church, the largest and grandest of all the colleges, with a fine quadrangle and other buildings, and a noble avenue of trees. It was founded by Wolsey in 1525, and its magnificent chapel is the cathedral church of the see of Oxford. The *hall* is a noble room.

Merton College, founded about 1264, has a very beautiful chapel of the fifteenth century, and the library is the oldest in the kingdom.

New College, founded by William of Wykeham, in 1386, is one of the wealthiest of the colleges, and the chapel is very handsome.

The *gardens of St. John's College* are much admired and the grounds of Magdalen College (perhaps the most beautiful college in Oxford) are no less attractive. The latter include "Addison's Walk," a shaded avenue that was his favorite resort when a student here. The *Bodleian Library* and *Picture Gallery*, the *Theatre* (built by Wren), the *Ashmolean Museum* (also by Wren), the *Radcliffe Library* and *Observatory*, the *Divinity School* (in the hall of which Cranmer, Latimer, and Ridley were tried in 1555), *St. Mary's Church*, the *Taylor Institute*, the *University Galleries* and *Museum*, the *Botanical Gardens*, and the *Martyr's Memorial* are also among the noteworthy things in Oxford. The *High Street* is the subject of one of Wordsworth's sonnets; and Hawthorne calls it "the noblest old street in England." Oxford depends mostly on the university, and on its attractions as a place of residence.

Stratford-on-Avon, Shakespeare's birthplace, is a pleasant town of Warwickshire, eight miles southwest of Warwick, twenty-two miles southeast of Birmingham, and one hundred and ten miles northeast of London. It stands on the right bank of the quiet Axon, which here is spanned by the "great and sumptuous bridge" of fourteen pointed arches, three hundred and seventy-six yards long, that was built by the Lord Mayor of London.

It is a quiet, old-fashioned place, with wide and well-kept streets, and many handsome mansions. The *Town Hall* was dedicated to the memory of the poet. Here is a statue of Shakespeare, presented by Garrick, on the pedestal of which are the lines from *Hamlet;* "Take him for all in all, we shall not look upon his like again." Very interesting is the *Shakespeare Memorial Building and Theater*, in a charming situation by the Avon, the outgrowth of the feeling that the poet should have a suitable monument in his native town.

SHAKESPEARE'S HOUSE, in Henley Street, became national property in 1847, and has been carefully restored. The room in which the poet is said to have been born seems to have undergone but little change since that day. In another room there is a small museum of Shakespearian curiosities.

STRATFORD CHURCH, in which Shakespeare is buried, is on the bank of the Avon. It is a large and elegant structure, with a graceful stone spire

one hundred and sixty-three feet high, erected in 1764 to replace a wooden one that had been taken down. The building has been judiciously restored in recent years. There is an elegant window illustrating Shakespeare's "Seven Ages," the contribution of Americans.

The grave of Shakespeare is in the chancel, covered by a plain flagstone, while above, on the wall to the left, is the monumental bust which is the most trustworthy representation of the poet. His wife lies near him, with his favorite daughter, "good Mistris Hall," and Dr. John Hall, her husband. In the chancel there is also an elegant marble monument to John Combe, the poet's friend.

SHOTTERY, where Anne Hathaway lived before she became the wife of Shakespeare, is about a mile from Stratford, and may be reached by a footpath through the fields. The cottage that was Anne's home has a timber and plaster front, and a thatched roof. The interior contains the oaken seat on which Shakespeare and Anne were wont to sit; many bits of venerable furniture; and, upstairs, a vast bed, on which many a Hathaway has drawn the last breath of life.

Strafford also possesses a memorial fountain, presented by George W. Childs of Philadelphia, and Harvard House, the birthplace of the mother of John Harvard, founder of Harvard University. It is still an important agricultural center; but its chief prosperity depends on the thirty thousand or so pilgrims who visit it yearly.

Ayr, forty miles from Glasgow, Scotland, by railway, is noted especially as the birthplace of Burns, the poet; as also the place where Wm. Wallace was imprisoned. The town is divided by the river Ayr, over which are the "twa brigs" of Burns. The Burns Cottage, or birthplace, the scene of his "Cotter's Saturday Night," is two miles south of the town, and is now used as a public memorial. It contains few articles associated with Burns.

ALLOWAY KIRK, mentioned in "Tam O'Shanter," or what remains of it, is one-half mile south of the Cottage. Near the church are the Burns monument, a circular shaft sixty feet in height, erected 1820, and the Doon, immortalized in the "Banks and Braes of Bonny Doon."

Burns died at Dumfries, where he had lived three years, and was buried in the churchyard there. Nineteen years later, upon the completion of the monument to his memory, his body was exhumed and placed within the Mausoleum at Dumfries.

Melrose, in the county of Roxburgh, thirty-one miles southeast of Edinburgh, is celebrated for the abbey founded by King David in 1136; destroyed by Edward II. in 1322; rebuilt by Bruce in 1326, and partly demolished by the English in 1545. Sir Walter Scott has given it an enduring description in his Lay of the Last Minstrel.

The material of which it is built is a very hard stone, and much of the carving is as perfect as when fresh from the sculptor's hand. Within its walls are the graves of kings, and nobles and priests of the olden time; among them Alexander II. of Scotland, and more than one of the renowned Earls of Douglas. Before the high altar the heart of King Robert Bruce is said to have been deposited. Sir David Brewster's grave is in the churchyard.

DRYBURGH ABBEY, four miles from Melrose, was founded about the same time as Melrose, and, like that, was destroyed in 1322 by Edward II. Robert I. restored it, at least in part; but it was again destroyed in 1544. St. Mary's aisle, the most beautiful part of the ruins, contains the tomb of Scott, buried here September 26, 1832; also the graves of his wife and his eldest son, and of his son-in-law Lockhart.

ABBOTSFORD, two miles from Melrose, was long the home of the "Great Enchanter of the North." The author's study is the most interesting room. There the old writing-table, the plain leathern armchair, the reference books, seem to indicate that Sir Walter has but just left them. The *Library* (twenty thousand volumes) contains a bust of Scott, by Chantry, and many miniatures. The roof is of carved oak, designed from models taken from Roslin Chapel. The *Drawing-room*, where Sir Walter died, and the little octagonal dressing-room contain many precious relics. The *Armory* has a fine collection of Scotch weapons.

ABBOTSFORD, HOME OF SIR WALTER SCOTT

Windsor, is in Berkshire, England, on the Thames, twenty-one and one-quarter miles from London. It contains a town hall, built by Sir Christopher Wren in 1686, the church of St. John the Baptist, with fine examples of Grinling Gibbon's wood-carving, and a fine Jubilee statue of Queen Victoria.

Windsor owes its chief importance to its castle, which stands east of the town on a height overlooking the River Thames, and is the principal royal residence in the kingdom. It was begun, or at least enlarged, by Henry I., and has been altered and added to by almost every sovereign since. The castle stands in the Home Park or "Little Park," which is four miles in circumference, and this again is connected with the Great Park, which is

STRATFORD-ON-AVON, IMMORTALIZED BY ITS ASSOCIATIONS WITH SHAKESPEARE

eighteen miles in circuit, and contains an avenue of trees three miles in length.

The chief features of interest in the castle are the old state apartments; St. George's Chapel, where the Knights of the Garter are installed, and the vaults of which contain the remains of Henry VI., Edward IV., Henry VIII., Charles I., George III., George IV., and William IV.; the Round Tower or ancient keep; and the present state apartments.

ETON COLLEGE is one-half mile from Windsor across the river. The stone chapel, one hundred and seventy-five feet long, is very handsome. There is also a bronze statue of Henry VI. The college was founded in 1440.

STOKE POGIS, the scene of Gray's *Elegy*, and the burial-place of the poet, is near Windsor.

There is a fine monument to Gray in *Stoke Park*.

Cambridge, fifty-six miles from London, and on the Cam, a narrow stream that rambles all over the town. Tradition gives 630 as the date of the foundation of the University; but the oldest college, *Peterhouse* or *St. Peter's*, can only be referred to 1257. The public buildings are the Shire Hall, Town Hall, University halls and library, and Fitzwilliam Museum.

There are seventeen colleges, inferior in architectural beauty to those of Oxford, though their associations are quite as interesting.

TRINITY, was founded by Henry VIII. in 1546, and has three fine quadrangles; a splendid hall in the Tudor style; gardens; and an important library, with busts of Newton and Bacon, Thorwaldsen's statue of Byron, Newton's telescope and some of John Milton's manuscripts.

CHRIST'S COLLEGE, founded in 1442, was Milton's college. In the gardens is *Milton's Mulberry-Tree*. The quadrangle was rebuilt by Inigo Jones.

JESUS COLLEGE (1496) and *Chapel* are very fine buildings, on the site of a Benedictine nunnery.

CAIUS (pronounced *Kees*) was founded in 1384, and enlarged in 1557 by Dr. Caius, physician to Queen Mary. Rebuilt lately, it is now one of the best.

CORPUS CHRISTI (1351) contains curious portraits, especially those of Sir Thomas More, Wolsey, Erasmus, and Foxe, the author of the *Book of Martyrs*.

KINGS COLLEGE (1441), founded by Henry VI., is the finest building in the University. The chapel is the finest specimen of perpendicular Gothic existing. The roof, unsupported by pillars, contains twelve divisions of exquisite lace-work tracery in stone. The twenty-four stained-glass windows, each fifty feet high, are beautiful.

The *Fitzwilliam Museum*, and some of the churches, especially the round chapel of *St. Sepulchre*, are of considerable interest. *All Saints* contains a monument, by Chantrey, to Henry Kirke White. *Girton College*, for women, founded in 1869, is about two miles northwest of the town. The walk along the Cam behind the colleges, with the view of the "Backs" and bridges, is the pride of Cambridge.

ENGLISH HISTORY

The island of Great Britain in the remotest times bore the name of *Albion*. From a very early period it was visited by Phœnicians, Carthaginians, and Greeks, for the purpose of obtaining tin.

Roman Period.—Cæsar's two expeditions, 55 and 54 B. C., made it known to the Romans, by whom it was generally called *Britannia;* but it was not till the time of Claudius, nearly a hundred years after, that the Romans made a serious attempt to convert Britain into a Roman province. Some forty years later, under Agricola, the ablest of the Roman generals in Britain, they had extended the limits of the Provincia Romana as far as the line of the Forth and the Clyde.

Here the Roman armies came into contact with the Caledonians of the interior, described by Tacitus as large-limbed, red-haired men. After defeating the Caledonians, Agricola marched victoriously northward as far as the Moray Firth, establishing stations and camps, remains of which are still to be seen. But the Romans were unable to retain their conquests in the northern part of the island, and were finally forced to abandon their northern wall and forts between the Clyde and the Forth and retire behind their second wall, built in 120 A. D. by Hadrian, between the Solway and the Tyne. Thus the southern part of the island alone remained Roman, and became specially known as Britannia, while the northern portion was distinctly called Caledonia.

The capital of Roman Britain was York (Eboracum). Under the rule of the Romans many flourishing towns arose. Great roads were made, traversing the whole country and helping very much to develop its industries. Christianity was also introduced, and took the place of the Druidism of the native British. Under the tuition of the Romans the useful arts and even many of the refinements of life found their way into the southern part of the island.

Creation of England and Scotland.—From the time of the Roman conquest, and still more decidedly after the Saxon invasions in the fifth century, the history of Britain branches off into a history of the southern part of the island, afterwards known as England, and a history of the northern part of the island, afterwards named Scotland. It was not till the union of the crowns in 1603 that the destinies of England and Scotland began again to unite; and it was not till the final union of the parliaments in 1707 that the histories of the two countries may be said to merge into one.

The Anglo-Saxon Period.—In 411 Honorius abandoned Britain, whose inhabitants, finding it impossible to defend themselves against the Picts, called to their aid the Saxons, who, in 449, assisted them so effectually that they took possession of the country and founded the four kingdoms of Essex, Wessex, Sussex, and Kent. The Angles, who followed them, established three other kingdoms, *viz.*, East Anglia, Deira, and Mercia, 540-584. All these kingdoms ended by being reduced to one, under Egbert, the Saxon king of Wessex, in 827.

After 835 the Danes ravaged England from time to time, but in 871 Alfred the Great forced them to desist, and from thence till near the end of his reign in 900, the Danes left the island in peace. Returning in 981, the Danes succeeded, in 1013, in putting their king, Sweyn, on the throne, which was not recovered by the Saxon dynasty till 1041.

Norman Conquest.—When William of Normandy landed in England to claim the crown which Edward the Confessor had bequeathed

to him, he found that the people had raised to the throne Harold, the son of a popular nobleman. The resources of the Saxons, however, had been wasted in domestic conflicts before the attack of William; and the battle of Hastings, in 1066 A. D., gave England with comparative ease to the Normans. The next twenty years saw the conquest completed, and nearly all the large landed estates of the Saxons pass, on every pretext except the true one, into the hands of the Normans. In the course of time the Normans were absorbed among the Saxons, their very language disappearing, though leaving many traces. From this union arose the English people and the English language as they now exist. The union of the Normans with the Saxons was not fully effected so long as the Normans retained their foreign possessions. In King John's reign the whole of these were lost excepting Guienne and Poitou.

In the reign of Stephen occurred the civil war between the Empress Maud, daughter of Henry I., and Stephen; she finally retired to France, and concluded a peace with her adversary. The great struggles of the successors of William were with the ecclesiastics and with the barons. Sometimes in these the popular sympathies were with, and sometimes against, the crown. The Conqueror himself and his immediate successors had no difficulty in maintaining the superiority of the courts of justice over the ecclesiastics; but even a sovereign so bold and skillful as Henry II. was forced, after the outcry occasioned by the murder of Thomas à Becket (1170 A. D.) to yield the point. The right to nominate the higher ecclesiastics was also secured by the popes.

The Plantagenets.—Under the Plantagenets an era of progress, generally, opened for England. The reign of Henry II. gave to the country the constitution of Clarendon; Ireland was conquered, 1172; England was divided into six circuits for the better administration of justice, and a digest of the laws was made by Glanville about 1181. Richard I. did little for the internal good of the land, his chief exploits occurring on the field of battle in foreign lands.

Magna Charta.—Under John two important events occurred: Magna Charta was obtained, and the French possessions were nearly all lost—both unmitigated blessings; but otherwise John's influence was cast against progress and reform. The degradation of the English monarchy was at its lowest when he consented (1213 A. D.) to hold the crown as a gift from Rome. From Henry II. something similar to the Great Charter had already been gained; but it was the Magna Charta of John which firmly established two great English principles—that no man should suffer arbitrary imprisonment, and that no tax should be imposed without the consent of the council of the nation.

During the reign of Henry III., England obtained her first regular parliament, and gold money was first coined in 1257. Edward I. was crowned 1272, and almost the first event of his reign was the conquest of Wales; Scotland also was subdued, but revolted again in 1297.

The reign of Edward II. was disastrous to himself and to England. The barons rose against his favorites, and Edward was murdered by the connivance of his wife. A new and vigorous era began with the reign of Edward III. The Scots were defeated at Halidown Hill; important victories were gained in France; the Order of the Garter was instituted, and, most important of all, law pleadings were ordered to be in English, instead of in the Norman-French tongue which had hitherto prevailed. Richard II. was crowned in 1377, and with his death in 1385, ended the line of the Plantagenets.

House of Lancaster.—Henry IV. was the first sovereign under this ill-fated house. His reign was disturbed by an insurrection of the Welsh under the Percies, but was otherwise peaceful. Henry V. invaded France and won the famous battle of Agincourt, and gained the French crown, 1420; but during the reign of his successor, Henry VI., all the French possessions were lost save Calais. He was deposed by Warwick the kingmaker, and the first representative of the House of York, Edward IV., was placed on the throne. The Wars of the Roses ensued, which continued through the two succeeding reigns of Edward V. and Richard III, ending with the death of Richard on Bosworth field, the coronation of Henry VII., 1485, and his marriage with Elizabeth, daughter of Edward IV.

The Tudors.—The union of the houses of York and Lancaster under Henry VII. begins a new period in English history. Under him England entered on her career of maritime discovery. He died, 1599, and was succeeded by his second son, Henry VIII. Henry VIII. succeeded under the most favorable auspices. He found the alliance of his now important country courted by both of his contemporaries, Francis I., of France, and Charles V., of Germany. But the interest of the foreign complications of the reign merges in the courts of England and of Rome. Henry was frequently engaged in hostilities with foreign countries, and the great victory of Flodden was won by one of his generals over James IV. of Scotland, husband of his sister Margaret. He threw off his allegiance to the pope, and became head of the church in England. He was six times married, and two of his wives were beheaded and two were repudiated. In his reign the scaffold was occupied by victims from every class of society. He died January 28, 1547, and was succeeded by his only son, Edward VI., whose mother was Jane Seymour, Henry's third wife.

Edward was in his tenth year, and the government was vested in a regency. In this reign the church of England was established, and the nation placed on the Protestant side in the struggle then going on in Europe. When Edward VI. died, July 6, 1553, Lady Jane Grey, to whom Edward had bequeathed the crown, was queen for ten days, when her party was dispersed, and Mary, eldest daughter of Henry VIII., ascended the throne.

The marriage of Mary with Philip II. of Spain led to war between England and France,

and an English army joined the Spanish force that invaded France. Mary was a devout Catholic, and caused Cranmer, Latimer, Ridley, and about three hundred other Protestants to be burned. Her death, November 17, 1558, left the throne to Elizabeth, who sided with the Protestants.

Elizabethan Period.—The reign of Elizabeth, which lasted nearly forty-five years, is one of the most brilliant in English history. She triumphed over her enemies, and raised her kingdom to the first place in Europe. She ruled over Scotland in fact, and put the queen of that country, the unfortunate Mary Queen of Scots, to death, after having held her in captivity nearly nineteen years. The Huguenots of France and Henry IV. received aid from her, and but for the assistance which she gave the Dutch they would have sunk under the power of Spain. She invited the Turks to join her in attacking the pope and Phillip II.; and over both those potentates she achieved a great triumph in 1588, when the Spanish armada was destroyed. The enterprise of Englishmen led them to circumnavigate the globe, to attempt colonization, to extend commerce, and to inaugurate trade relations with India. Elizabeth died March 24, 1603, and with her terminated the Tudor dynasty, after an existence of nearly one hundred and eighteen years.

House of Stuart.—Elizabeth was succeeded by James VI. of Scotland, the son of her victim, Mary Stuart, and first king of England of the Stuart line, who inherited the English crown in virtue of his descent from Margaret Tudor, eldest daughter of Henry VII., who had married his great-grandfather, James IV. The new king, under the title James I., was hailed with much satisfaction by the English; but he was a pedant and a tyrant, and soon lost his popularity. His first parliament, 1604, in reply to his assertion that all their privileges were derived from him, asserted all those principles for which the English constitutionalists contended as facts not to be questioned.

Then began that civil contest which lasted down to 1689 in full force, and which was not utterly at an end till 1746. The foreign policy of James was as vicious as his home policy, and England sank in the estimation of Europe. He died in 1625, and was succeeded by his son Charles I.

For eleven years (1629-1640) this ruler called no parliament, and England was ruled as despotically as France. His chief instruments were Wentworth, afterward earl of Strafford, and Laud, archbishop of Canterbury. Laud sought to fasten the English church policy on Scotland. War between the Scotch people and the English government followed, and Charles was compelled to call a parliament April, 1640, which was dissolved in a few days, and became known as the "short parliament." Six months later assembled the famous "long parliament," which proceeded to divest the king of much of his power.

Period of the Commonwealth.—The contest between the king and parliament under the lead of Vane, Cromwell and others, led to the great English Civil war, which began in the latter part of 1642. Cromwell was everywhere victorious in the field. The army became the source of all power. The king was tried, condemned and executed. Ireland was conquered by Cromwell, who was almost equally successful in Scotland. The battle of Worcester, September 3, 1651, crushed the royalists for nearly nine years. In 1653 Cromwell dissolved the parliament by force, and was master of England for five years, as Lord Protector. After his death, in 1658, the military and civil republicans quarreled.

Restoration of the House of Stuart.—Richard, the son and successor of the great Protector, resigned, and the restoration of the Stuarts was effected in the person of Charles II., 1660, whose reign in law dates from the time of his father's execution, January 30, 1649. The king's popularity soon declined, mainly on account of his foreign policy. An unnecessary war with the Dutch produced much disgrace. The triple alliance with Sweden and Holland for a brief interval stayed the course of Louis XIV., but the king's forces assisted in the war on Holland made by Louis, and afterward assistance was sent to the Dutch.

The peace of 1678 was followed by the excitement caused by the alleged popish plot. Parliament after parliament was elected, met, set itself in decided opposition to the government, and was dissolved. The leading object of the opposition was the exclusion of the duke of York, Charles' brother, from the line of succession. Charles II. died in February, 1685, and his brother James II., an avowed Roman Catholic, came to the throne.

James II. was bent on the establishment of a despotism, by the destruction of the constitution in church and state. He punished Monmouth's rebellion with excessive vindictiveness. The king prorogued parliament in November, 1685, and that body never met again. For three years he governed despotically, and a perpetual contest was waged between him and his people.

In June, 1688, it was announced that the king's second wife had given birth to a prince, who was afterwards known as the pretender. It was generally believed that a supposititious child had been placed in the position of heir apparent.

In November, William, prince of Orange, who was the king's nephew and had married his eldest daughter Mary, heir apparent to the British crown, landed in England at the head of an army. James fled, and William and Mary were proclaimed sovereigns.

War was declared against France in 1689, and was ended in 1697. Ireland was subdued. Mary died in 1694, and left William III. sole monarch till his death in March, 1702, when the succession passed to Anne, second daughter of James II.

In May war was declared against France, and after spendid victories achieved by Marlborough, it was ended by the treaty of Utrecht in 1713. The union of England and Scotland was effected in 1707. Anne died August 1, 1714, and the crown passed to the house of Hanover in the person of George I.

House of Hanover under the Four Georges.—The rebellion of 1715 in behalf of the Stuarts proved a failure. The bursting of the "South sea bubble" in 1720 placed Robert Walpole in control of the government, which he retained under George II. (who ascended the throne in 1727) till 1742. His fall was occasioned by a war with Spain, to which one with France was soon added, growing out of the question of the Austrian succession. In 1746 the contest between the reigning dynasty and the remains of the Stuart party was brought to an end at Culloden where the duke of Cumberland defeated Charles Edward. The treaty of Aix-la-Chapelle in 1748 restored peace to Europe for a few years.

The whigs continued to rule, headed by Henry Pelham, and after his death in 1754 by his brother, the duke of Newcastle. The renewal of the war with France in 1755 was followed by the formation in 1757 of the celebrated Pitt-Newcastle ministry, which carried on the contest with great vigor; so that when George II. died, October 25, 1760, his fleets and armies were everywhere triumphant. The foundation of the East Indian empire of England was laid at Plassey June 23, 1757. French America was conquered at Quebec, September 13, 1759.

The new king, George III. (the first English-born king of his house), grandson of George II., was by nature and education as despotic as the worst of the Stuarts. The attempt to tax the American colonies led to the American revolution. The English in the last years of the war had to fight the Americans, the French, the Spaniards, and the Dutch. The peace of 1783 left England in a low condition.

When France became convulsed by the revolution, England engaged in the war against her that soon followed, which lasted, with two brief intervals, till 1815, ending in the complete triumph of England and her allies. The legislative union between Ireland and Great Britain went into effect January 1, 1801. The exertions made by England, beginning with the administration of Pitt, were vast. Her fleets, chiefly under Nelson, achieved splendid victories over the French and Spaniards, and in the last years of the war her armies were greatly distinguished under the lead of Wellington, who, at Waterloo, inflicted the final defeat on Napoleon in 1815.

In 1810 George III. lost his reason finally, and his eldest son was prince regent till 1820 when he became king as George IV.

In 1812 England became involved in a war with the United States, growing out of the impressment and right of search questions. The contest was virtually terminated by the treaty of Ghent, December 24, 1814. In 1829 the Catholic emancipation act was passed, under a ministry headed by Wellington and Peel. George IV. died in 1830, and was succeeded by his brother, the duke of Clarence, as William IV.

In March, 1831, a bill for parliamentary reform was introduced into the house of commons by Lord John Russell, and after long debates in parliament and intense excitement in the country, caused by the opposition of the house of lords, a bill making extensive changes in the constitution of the house of commons finally passed in June, 1832, under the ministry of Earl Grey.

The first reformed parliament, which met January 29, 1833, contained an overwhelming majority of reformers. Lord Grey retired from office in 1834, and was succeeded by Lord Melbourne. Toward the close of the same year the government was committed to Sir Robert Peel, who formed a conservative ministry. Peel continued in office until April 8, 1835, when he retired, having been repeatedly beaten on Irish church questions. Lord Melbourne returned to office, with many of his old colleagues. The king died on June 20, 1837, and was succeeded by his niece Victoria, the only child of Edward, duke of Kent, fourth son of George III.

The Victorian Period. The accession of Victoria led to the separation of the crowns of England and Hanover, which had been worn by the same persons since 1714. In 1841 Melbourne resigned, and the conservatives under Peel came into power. In 1846 the Peel ministry brought forward an act to protect life in Ireland, but it was defeated in the commons on the same day that the Corn Laws were repealed, and the ministry came to an end, being succeeded by one at the head of which was Lord John Russell. The Russell ministry went out of office in 1852, and for several months the tories, led by Lord Derby and Mr. Disraeli, were at the head of affairs. This ministry was followed by one composed of the coalesced whigs and Peelites, headed by Lord Aberdeen.

Crimean War.—In 1853 the troubles on the Turkish question began, and war was declared against Russia by France and England in March, 1854. Large fleets and armies were sent to the East, and fleets to the Baltic. The Crimea was invaded, the victory of the Alma won by the allies, and Sebastopol partially invested. On September 8 Sebastopol was reduced, the French storming the Malakhoff, and peace was restored by a congress of the powers at Paris in March, 1856.

Indian Mutiny and Final Absorption of the Indian Empire.—Early in 1857 a formidable revolt broke out in England's great Bengal army of sepoys. Delhi fell into the hands of the rebels, and the nominal Mogul emperor found himself once more a sovereign in reality. The mutiny spread rapidly, and in a short time the whole Bengal army had become hostile to the English. The military reputation of England was greatly raised by the successes of her armies in India, achieved under the lead of Sir Henry Havelock, Sir Colin Campbell, and others. In eight months after the breaking out of the mutiny there were nearly seventy thousand effective English troops there, and new native corps had replaced the sepoys. By the end of 1858 the revolt was totally suppressed. The rebellion resulted in the transfer of the immediate government of India from the East India company to the crown, the old directory sitting for the last time September 1, 1858.

In February, 1858, the Palmerston ministry was driven from office, and a new conservative ministry was formed, with the earl of Derby as premier, and Mr. Disraeli as Chancellor of the Exchequer. This ministry soon resigned and Lord Palmerston resumed office in June, 1859. On May 13, 1861, Great Britain recognized the belligerency of the Confederacy during the American Civil war and the blockade of their ports, and proclaimed neutrality.

In 1868 Disraeli became Prime Minister in succession to Lord Derby, but was defeated in the general election of that year and resigned before the end of the year.

Disraeli was succeeded by Gladstone, who, during the five years of his ministry passed more measures than almost any previous one. Education became compulsory. Trade unions were legalized, the Ballot Act was passed. The Irish Church Act and a Land Act for Ireland were passed, and the state of Ireland at the time also necessitated Coercion Acts.

In 1874 Gladstone resigned, and the Conservatives were returned to power, having for the first time since 1841 a real majority in the House of Commons. The ministry formed by Disraeli was a brilliant one, and the Opposition was for a time weakened by the withdrawal into private life of Gladstone. The great question of Home Rule was gradually forcing itself to the front, and the Irish tactics in the House became obstructive. It was at this time that Disraeli put forward his imperial policy, and the ministry is chiefly noticeable for its attitude on foreign and imperial affairs.

From 1879 to the present time Irish agitation has been for Great Britain a source of serious disquiet. In 1882 Mr. Gladstone adopted a policy of conciliation, but the murder of Lord Frederick Cavendish and of Mr. Burke caused its abandonment and the immediate passing of a coercion law which virtually placed Ireland under martial law. In 1882 the Egyptian army, under the leadership of Arabi Bey, having revolted from the khedive's authority, Great Britain sent a large naval expedition to Egypt, bombarded Alexandria, and defeated the rebellious forces. Since that date the Egyptian government has been under British suzerainty, and in 1896, a British expedition was sent up the Nile with the purpose of regaining the provinces of Egypt held by the mahdist forces.

Within the past quarter of a century Great Britain has largely extended its territory in Africa, bringing great areas in the south and east of the continent under its protection. During the same interval several subjects of dispute have arisen with the United States, which have all been peacefully settled. An imposing festival took place in London in June, 1897, on the occasion of the sixtieth anniversary of Queen Victoria's accession, in which all sections of the empire took part.

Boer War.—October 11, 1899, war was declared by the Boers of the Transvaal and Orange Free State, the aim being the destruction of the British paramountcy in South Africa. This led to the annexation of those states by the British, after a fierce contest, in 1900. In 1904, a new parliament was elected, which again supported the Conservative ministry, with a slightly increased majority.

House of Saxe-Coburg.* — Victoria died January 22, 1901, and was succeeded by her eldest son, Edward VII., who proved himself to be an active promoter of peaceful relations with other countries.

The Boer war was concluded in the middle of 1902 by the treaty of Vereeniging, and almost immediately afterward Lord Salisbury retired from office, being succeeded in the premiership by his nephew, Mr. A. J. Balfour. The education act of 1902 did away with school boards where they existed, bringing the voluntary and former board schools alike under education committees in England and Wales, and the same change was made in London in 1903. The Irish land act of 1903 was a measure of the first importance, its object being to transfer practically all the agricultural land of Ireland to farmers or peasant proprietors. In the autumn of 1903 Mr. Chamberlain resigned office in order to be free to advocate a change in the country's fiscal policy, intended to unite the colonies more closely with the mother country—a change which many have regarded as meaning a return to protection.

In 1905 the Liberal party returned to power under the leadership of Sir Henry Campbell Bannerman, who was succeeded after his death in 1908 by H. H. Asquith.

On May 5, 1910, the illness of King Edward was announced, followed by that of his death the next day. His son, George V, succeeded to the throne May 6, 1910. This year also saw the settlement of the fisheries dispute with the United States, which had remained unsettled for more than a hundred years.

A lengthy battle had begun to be waged against the hereditary prerogatives of the House of Lords, to which the death of the king caused a temporary cessation, but, in August, 1911, the Upper House lost its permanent veto.

Early in 1913 the Irish home rule question became the dominant issue and a bill favoring it was passed by the House of Commons by a large majority, only to be overwhelmingly rejected in the House of Lords.

The year 1914 marked the entrance of Great Britain into the great European war that engulfed practically the whole of Europe and one-third of the civilized world.

With the end of the war, Great Britain made no territorial claims in Europe but established a firmer hold on Egypt and Mesopotamia (*area*, about 55,000 square miles). Britain was also awarded by the Paris Peace Conference the mandate over former German East Africa (*area*, 384,170 square miles; *population*, 7,516,000), and, together with France, is to recommend to the League of Nations the disposition of Togoland (*area*, 33,668 square miles; *population*, 1,004,000), and the Cameroons (*area*, 305,000; *population*, 3,501,000). Three British dominions — Australia, New Zealand, and Union of South Africa — have likewise received mandates over former German colonies.

Today (1924) home rule for Ireland, postwar finances, and the international trade situation are the great problems of British policy.

* The name of this royal house was changed to House of Windsor after the outbreak of the European War of 1914–1918.

IMPORTANT FACTS CONCERNING THE BRITISH EMPIRE

This title is usually given to the total territory governed or administered in the name of the British government centralized in London. It includes the United Kingdom of Great Britain and Ireland, the self-governing Dominions, Dependencies, Crown colonies and Protectorates whose inhabitants look to the king as their ultimate head. Of the whole area of the lands of the globe, the British Empire occupies nearly one-quarter, extending to every continent.

THE UNITED KINGDOM

Countries	Area in Square Miles	Population, 1911	How and When Acquired by England	Character of Government
EUROPE:				
England	50,839	34,043,076	.....	Constitutional Monarchy. Constitute the United Kingdom of Great Britain and Ireland.
Wales	7,470	2,032,183	Conquest, 1282	
Scotland	29,785	4,759,445	Union, 1603	
Ireland	32,585	4,381,951	Conquest, 1172	
Islands	302	148,934	.....	

DEPENDENCIES AND COLONIES

EUROPE:				
Gibraltar	2	23,553	Conquest, 1704	Military Governor.
Malta, etc.	122	215,879	Treaty cession, 1814	Governor; Councils.
ASIA:				
India (including Burma)	1,800,258	314,955,000	Conquest, begun 1757. Transfer from East India Co., 1858	Viceroy; Council; Departments. Native rulers under Political Supervision.
Ceylon	25,365	4,038,456	Treaty cession, 1801	Governor; Executive and Legislative Councils.
Cyprus	3,584	261,587	Convention with Turkey, 1878	
Aden and Socotra	3,070	53,222	(Aden) Conquest, 1839	
Straits Settlements	1,500	620,127	Treaty cession, 1785-1824	
Hongkong	30.5	428,888	Treaty cession, 1841	
Labuan	31	8,411	Treaty cession, 1846	
British North Borneo	31,000	204,000	Cession to company, 1877	Governor (British North Borneo Company).
AFRICA:				
Union of South Africa (including Cape of Good Hope, Natal, The Transvaal, and Orange River Colony)	473,184	5,938,499	Treaty, conquest and cession, 1588-1900	The Union of South Africa—Governor-General; Executive Council; Senate; House of Assembly.
St. Helena	47	3,553	Conquest, 1673	Governor and Executive Council.
Ascension	38	266	Annexation, 1815	Under the Admiralty.
Mauritius, etc.	1,063	373,336	Conquest and cession, 1810, 1814	Governor; Executive and Councils.
British East Africa (including the Protectorate of Nyasaland, East Africa, Uganda, Zanzibar and Somaliland)	420,466	8,728,276	Conquest and cession, 1870-1890	Governor; Executive and Legislative Councils.
British West Africa (including Gambia, Gold Coast Colony, Northern Nigeria, Southern Nigeria, and Sierra Leone)	495,490	17,442,772	Conquest, annexation, cession, 1673 1872	Governor; Executive and Legislative Councils.
AMERICA:				
Dominion of Canada	3,745,574	.....	Conquest and settlement, 1670-1858	Governor General; Parliament.
Ontario	260,862	2,519,902	Conquest, 1759-1760	
Quebec	347,350	2,000,697	Conquest, 1759-1760	
New Brunswick	27,985	351,815	Treaty cession, 1763	
Nova Scotia	21,428	461,847	Conquest, 1627	
Manitoba	73,732	454,691	Settlement, 1813	
British Columbia	312,363	362,768	Transfer to crown, 1858	
Alberta	253,540	372,919	Settlement	
Saskatchewan (including Mackenzie, Ungava and Franklin)	250,650	453,508	Settlement	
Northwest Territories	1,418,000	19,330	Charter, 1670	
Yukon Territory	196,976	7,000	Charter, 1670	
Prince Edward Island	2,184	93,722	Conquest, 1745	
Newfoundland (and Labrador)	42,734 120,000	230,000	Treaty cession, 1713	Governor; Parliament.
British Guiana	104,000	305,090	Conquest and cession, 1803-1814	Governor; Executive and Legislative Councils.
British Honduras	8,598	44,000	Conquest, 1798	
Jamaica	4,207	831,123	Conquest, 1655	
Trinidad and Tobago	1,868	358,641	.....	
Barbadoes	166	196,287	Settlement, 1605	
Bahamas	5,794	55,872	Settlement, 1629	
Bermuda	19	19,289	Settlement, 1612	
Other Islands	8,742	255,000	.....	
AUSTRALASIA:				
Commonwealth of Australia (including Australia, Tasmania, and Papua)	3,091,496	5,140,393	Settlement	Separate State Legislatures and Governments (Governors); Federal Parliament and Government; Governor-General and Executive Council.
Dominion of New Zealand	104,471	982,926	Purchase, 1845	Governor and Houses of Parliament.
Fiji	7,435	128,404	Cession from the natives, 1874	Governor and Legislative Council.

TABLE OF THE SOVEREIGNS OF ENGLAND

Names and Lineage of Sovereigns	Began to Reign	Years of Age	L'gth of Reign	Death	Character	Principal Statesmen	Chief Warriors	Events of Reign
ANGLO-SAXON KINGS								
EGBERT (775?-837).—Son of Alcmund, descended from Inigisil, brother to Ina, king of West Saxons.	801		37	Natural causes.	Possessed all the qualities required in a warrior.		The king—Ethelwolf—Kenneth.	The kingdoms of the Heptarchy united, and take the name of England.
ETHELWOLF (——358).—Son of Egbert.	838		20	Natural causes.	Pious, wise, valiant and clement. A lover of peace, and zealous for religion.	Athelstan.	Wolfhere—Ethelhelm—Ceorle.	Tithes instituted; London plundered by the Danes; England becomes tributary to the Holy See.
ETHELBALD.....—Son of Ethelwolf.	858		2	Natural causes.	Neither pious nor valiant.	Swithun, Bishop of Winchester.	Osric.	Scots defeated by the Britons.
ETHELBERT.....—Son of Ethelwolf.	860		6	Natural causes.	Sweet-tempered, wise, pious and valiant.		The king.	Winchester burnt by the Danes.
ETHELRED I. (871).—Brother to Ethelbert.	866		6	Killed in the battle of Wittingham.	Pious, valiant, prudent, and just.		Young Alfred.	Battles of Aston and Basing—York taken.
ALFRED The Great (849-901).—Brother to Ethelred, and son of Ethelwolf.	872	22	28	By a contraction of the nerves.	A great sovereign, warrior, legislator, politician and scholar.		The king—Oddune, earl of Devonshire.	University of Oxford founded. Juries instituted. England divided into shires, tithings and hundreds.
EDWARD the Elder (870?-924).—Second son of Alfred the Great.	900	17	25	Natural causes.	Equal to his father—his love for learning and lenity excepted.		The king.	Northumberland and East Anglia united to the crown. University of Cambridge founded. Battles of Temsford and Malden.
ATHELSTAN (895?-941).—Natural son of Edward the Elder.	925	20	16	Natural causes.	Possessed uncommon virtues; wise, valiant and just.	Turketul, Chancellor.	Guy of Warwick.	Constantine III. of Scotland and six Irish and Welsh kings killed at battle of Brunanburg.
EDMUND the Pious (923-946).—Eldest legitimate son of Edward the Elder.	941	25	7	Assassinated by Leolf, while feasting at Puckle-kirk.	Pious, valiant and just, and much respected by his people.		The king.	Cumberland and Westmoreland given up to Malcolm, king of Scotland.
EDRED (——955?).—Second legitimate son of Edward the Elder.	948	29	7	Natural causes.	Pious and valiant, but too obsequious to his council.	Aldheim, Archbishop of Canterbury.	The king.	Northumbrian Danes reduced.
EDWY (939?-959).—Eldest son of Edmund the Pious.	955	17	4	Died of grief on his brother being set up in his stead	Hated the monks, and persecuted them, which caused a rebellion.	Odo, Archbishop of Canterbury.	Prince Edgar.	Rebellion of the Mercians.
EDGAR (943?-975).—Brother to Edwy.	959	13	16	Natural causes.	Pacific, active, wise and industrious.	Ethelwold.		King of Wales, Ireland, and the Isle of Man, recognize Edgar for their sovereign.
EDWARD the Martyr (961?-978).—Eldest son of Edgar.	975	15	3	Assassinated by order of his step-mother, Elfrida.	Amiable and sweet-tempered.	Dustan.		
ETHELRED II. (*Sweyn*) (——1016).—Brother to Edward the Martyr, and son of the beautiful Elfrida.	979	12	37	Natural causes.	Cowardly, indolent, and avaricious.	Siricius, Archbishop of Canterbury.	Prince Edmund. Alfric.	Arabic figures introduced. Sweyn, king of Denmark, conquers England.
EDMUND, Ironside (989-1017).—Eldest son of Ethelred II.	1016	26	1	Assassinated by order of Edric.	Valiant and prudent.	Edric, Earl of Wilts.		Massacre of the Danes. England divided between Edward and Canute I.
DANISH KINGS								
CANUTE I. (995-1035).—Son of Sweyn, King of Denmark.	1017		19	Natural causes.	A great king; humble, just, and truly religious.	Thurkell, Duke of East Anglia—Urick, Duke of Northumberland.	Godwin, Earl of Kent.	Parents prohibited selling their children. End of the Danish war of two hundred years.

TABLE OF THE SOVEREIGNS OF ENGLAND—Continued

Names and Lineage of Sovereigns	Began to Reign	Years of Age	L'gth of Reign	Death	Character	Principal Statesmen	Chief Warriors	Events of Reign
DANISH KINGS—Continued								
HAROLD I. (1040——Second son of Canute I., by Queen Alfwen.	1036	30	3	Occasioned by intemperance.	Impious, unjust, dissolute and mean.	Earl Godwin.	Godwin, Earl of Kent.	Paper first used in England.
CANUTE II. (1019-1042).—Third son of Canute I., by Emma of Normandy.	1039	29	2	By excessive eating.	To the vices of Harold I., he added that of cruelty.	Earl Godwin.	Leofric, Duke of Mercia.	
SAXON KINGS								
EDWARD the Confessor (1004-1066).—Son of Edmund Ironside.	1041	40	24	Natural causes.	Honored as a great saint; of a mild and peaceful temper; was charitable, but had no great genius.	Robert, Archbishop of Canterbury—Harold.	Siward, Duke of Northumberland.	Common law of England established. Westminster Abbey founded.
HAROLD II. (1022-1066).—Son of Earl Godwin, by the eldest daughter of Canute I.	1065		1	Killed in the battle of Hastings.	A valiant warrior.	Morcar, Earl of Northumberland.	Gurth and Leofwin, the king's brothers.	Battle of Hastings, Norman conquest.
NORMAN KINGS								
WILLIAM the Conqueror (1027-1087).—Son of Robert, Duke of Normandy, by his mistress Harlotte.	1066	40	21	Death occasioned by heat at the burning of Mantes.	Possessed great bodily strength, a great soul and an elevated mind, and a prodigious genius; and governed the English with a heavy hand.	Odo, Bishop of Bayeaux. Fitzosborne, Earl of Hereford.	Malcolm, King of Scotland.	Tower of London built. Doomsday book. Bishoprics created.
WILLIAM Rufus (1056-1100).—Second son of William the Conqueror.	1087	31	13	Accidentally shot by Sir Walter Tyrrell, in New Forest.	Courageous and vicious to a high degree.	Herbert—Lozinga.	Earl of Northumberland—Duke of Normandy.	First Holy War. Westminster Hall built. Reduction of the Welsh.
HENRY I. (1068-1135).—Brother of William Rufus.	1100	32	35	Death occasioned by eating too many lampreys.	Handsome, brave, sober, cruel, avaricious, and unclean.	Archbishop Anselm. Bishop of Salisbury.	Earl of Flanders.	Normandy conquered. First Parliament.
STEPHEN (1105-1154).—Son of Stephen, Earl of Blois, and Adela, daughter of William the Conqueror.	1135	31	19	Natural causes.	In person majestic; his air placid and insinuating. Possessed great courage, an elevated genius, and sound judgment.	William of Ypres.	Earl of Gloucester.	Canon law introduced.
PLANTAGENETS								
HENRY II. (1133-1189).—Eldest son of Geoffrey, Earl of Anjou, and of the Empress Maud. Heir to Henry I.	1154	21	35	Natural, before the High Altar at Chinon.	Brave, generous, magnificent, clement, just, prudent, ambitious, lustful, and violent in anger.	Thomas à Becket, Lord Chancellor.	Strongbow, Earl of Pembroke.	King takes possession of Ireland. Judicial circuits established.
RICHARD I. (1157-1199).—Second son of Henry II.	1189	33	10	Killed by a cross-bowman, at the siege of Chalus.	Brave to a high degree; but possessed no other virtue.	Bishop of Durham—Longchamp, Bishop of Ely.	The king, surnamed Cœur de Lion.	London divided into companies. King joins the Crusade.
King JOHN (1166-1216).—Brother to Richard I.	199	33	17	Died of grief for having lost his rich baggage.	Witty, hot-headed and hasty. After his first transports, soft, indolent, fearful and wavering.	Archbishop of Hubert, Chancellor.	Prince Arthur.	Phillip II. of France takes possession of Normandy. War with the barons. Magna Charta signed.
HENRY III. (1207-1272)—King John's eldest son.	1216	9	56	Natural causes.	Inconstant, capricious and prodigal of his money; continent, and averse to cruelty.	William, Earl of Pembroke, Hugh de Burgh, Bishop of Winchester.	Simon, Earl of Leicester. Prince Edward.	Intestine wars. Westminster Abbey rebuilt.
EDWARD I. (1239-1307).—Eldest son of Henry III.	1272	33	35	Natural causes.	A good king and father, a formidable enemy, and a great captain; chaste, just, prudent and moderate.	Giffard Archbishop of York.	Llewellyn Prince of Wales.	Wales united to England. Mariner's compass invented.

TABLE OF THE SOVEREIGNS OF ENGLAND—Continued

Names and Lineage of Sovereigns	Began to Reign	Years of Age	L'gth of Reign	Death	Character	Principal Statesmen	Chief Warriors	Events of Reign
PLATAGENETS—Continued								
EDWARD II. (1284-1327).—Eldest son of Edward I.	1307	23	20	Murdered by Gourney and Maltravers at Berkley Castle.	Handsome shaped, but had neither the capacity of warrior, statesman, or man of genius.	Pierce Gaveston—Hugh de Spencer.	Guy, Earl of Warwick.	King abdicates the throne. Courts of Nisi Prius established.
EDWARD III. (1312-1377).—Son of Edward II.	1327	14	50	Died of the St. Anthony's fire at Sheen.	An excellent prince; gentle, beneficent, and valiant.	Mortimer, Earl of March.	Edward, the Black Prince —— Sir Richard Knowles.	Battles of Cressy and Poictiers. Order of the Garter instituted.
RICHARD II. (1366-1400).—Son of Edward the Black Prince, and grandson of Edward III.	1377	11	22	Murdered by Exton, at Pontefract Castle, by order of Henry IV.	Handsomest monarch in the world. Kind, magnificent, soft, timid, of little genius, and a slave to his favorites.	Richard de Vere, Duke of Ireland, A. Neville, Archbishop of York.	H. Percy, surnamed Hotspur — John of Gaunt.	Wat Tyler's insurrection. King deposed.
HOUSE OF LANCASTER								
HENRY IV. (1366?-1413).—Son of John of Gaunt, and grandson of Edward III.	1399	32	14	Died of a dropsy.	Courageous, prudent, vigilant, and extremely jealous of his throne, which he obtained by unwarrantable means.	R. Neville, Earl of Westmoreland.	Sir John Oldcastle.	Battle of Shrewsbury.
HENRY V. (1388-1422).—Eldest son of Henry IV.	1413	24	9	Natural causes.	A good soldier and politician; had an elevated genius; was extremely ambitious, and inclined to cruelty.	Beaufort, Duke of Exeter.	Duke of Gloucester, Wodehouse Gam.	Battle of Agincourt. Siege of Rouen.
HENRY VI. (1421-1471).—Son of Henry V.	1422	9 m.	39	Dethroned. Afterwards killed, by order of Edward IV.	Just, chaste, temperate, pious and patient; but had a weak mind.	Humphrey, Duke of Gloucester, Duke of Suffolk. Duke of Somerset.	Joan of Arc, Duke of Bedford, Lord Talbot, R. Neville, Earl of Warwick.	Battles of Crevant, Verneuil, St. Albans, and Towton. Siege of Orleans.
HOUSE OF YORK								
EDWARD IV. (1441-1483).—Son of Richard, Duke of York; descendant of Edward III.	1461	19	22	Death occasioned by excessive eating.	One of the handsomest men in England, but after crowned was a voluptuary.	Earl Rivers.	Admiral Coulon.	Printing first in use.
EDWARD V. (1470-1483). — Eldest son of Edward IV.	1483	12	2 m.	Smothered by order of Richard, Duke of Gloucester.		Richard, Duke of Gloucester.	Lord Hastings.	Richard's usurpation.
RICHARD III. (1452-1485).—Brother to Edward IV.	1483	30	2	Killed in the battle of Bosworth Field.	Small, ugly and crooked backed; dissembling and cruel, yet sagacious and brave.	Lord Stanley.	Henry, Earl of Richmond. Duke of Buckingham.	Battle of Bosworth Field.
HOUSE OF TUDOR								
HENRY VII. (1457-1509).—Son of Margaret, Countess of Richmond; descendant of John of Gaunt.	1485	28	24	By consumption.	A wise and able prince; pious, chaste, temperate and just; but insatiably covetous.	Cardinal Morton. Sir Edward Poynings.	Lord Lovell.	Discovery of America.
HENRY VIII. (1491-1547).—Second son of Henry VII.	1509	18	38	Natural causes.	Comely, but very corpulent; brave, candid and liberal; versed in music, philosophy, and divinity; yet was cruel and presumptuous.	Cardinal Wolsey, Sir Thomas More, Fox, Cromwell.	Duke of Norfolk —— Earl of Surrey. Lord Maxwell.	The Reformation. Monasteries dissolved.
EDWARD VI. (1537-1553).—Son of Henry VIII., by Jane Seymour.	1547	9	6	Of a consumption.	Sweet tempered, and had a great genius.	Seymour, Duke of Somerset—Dudley, Earl of Warwick.	Lord Russell.	Religious insurrection.
QUEEN MARY (1516-1558).—Daughter of Henry VIII., by Catharine of Aragon.	1553	38	5	Of a dropsy.	Small capacity, bigoted, revengeful and cruel.	Gardiner, Chancellor.	Duke of Savoy.	Catholic religion restored.

TABLE OF THE SOVEREIGNS OF ENGLAND—Continued

Names and Lineage of Sovereigns	Began to Reign	Years of Age	L'gth of Reign	Death	Character	Principal Statesmen	Chief Warriors	Events of Reign
HOUSE OF TUDOR—Continued								
Queen ELIZABETH (1533-1603).—Daughter of Henry VIII., by Anne Boleyn.	1558	25	45	Natural causes.	Tolerably handsome; had a noble air, and great affability; celebrated for her wit, judgment, economy, policy, sincerity, justice, liberality, and magnificence.	Robert Dudley, Sir Nicholas Bacon. Lord Burleigh.	Admiral Howard—Sir Francis Drake. Sir F. Vere. Sir P. Sidney.	Mary Queen of Scots executed. Spanish Armada destroyed. Protestant religion restored.
HOUSE OF STUART								
JAMES I. (1566-1625). Son of Mary, Queen of Scots, and Henry Stuart, Lord Darnley; and great-grandson of Margaret, daughter of Henry VII.	1603	37	22	Of an ague.	Learned and pacific, but wavering and undetermined.	Robert Car, Earl of Somerset. George Villiers, Duke of Buckingham. Earl of Salisbury.	Sir Horace Vere.	Union of the crowns of England and Scotland. Gunpowder plot.
CHARLES I. (1600-1649).—Third son of James I.	1625	25	24	Beheaded near the windows of the banqueting house, Whitehall.	Religious, sober, chaste, affable and courageous; had great penetration and judgment, but too fond of prerogative.	Earls of Portland and Strafford—Laud, Archbishop of Canterbury.	Earl of Essex. Sir T. Fairfax, Earl of Manchester.	Battles of Edge Hill, Tadcaster and Gisborough.
COMMONWEALTH declared May 19.	1649		11			Oliver Cromwell.	Admiral Blake, General Monk.	Charles I. beheaded. Royal power usurped. Battle of Dunbar.
HOUSE OF STUART								
CHARLES II. (1630-1685).—Eldest son of Charles I.	1660	29	25	Supposed to have been poisoned.	Extremely liberal and affable; had a sprightly and witty genius, and a wonderful conception.	Earl of Clarendon.	Duke of York. Earl of Sandwich.	Restoration of monarchy. Plague and fire in London. Royal Society founded.
JAMES II. (1633-1701). Brother to Charles II.	1685	52	3	Natural, having abdicated the throne.	A kind father, husband and master; more pious than resolute, and too submissive to his ministers.	Chancellor Jeffries.	Duke of Monmouth.	King abdicates the throne. Revolution.
WILLIAM (1650-1702) and MARY (1662-1694).—William, Prince of Orange, (Holland). Mary, eldest daughter of James II., by Anne Hyde.	1688	W. 37 M. 26	W. 14 M. 6	Mary died of the smallpox; William, by a fall from his horse.	Mary, pious and amiable; had an air of grandeur, without pride or affectation. William, not comely in person, had a great genius, was a good statesman and warrior.	Earl of Sunderland, Earl of Tankerville.	Russell, Shovel, Ginkle.	Bank of England established. Siege of Namur. Battles of Boyne and La Hogue. Treaty of Ryswick.
Queen ANNE (1665-1714).—Second daughter of King James II., and consort of George, Prince of Denmark.	1702	37	12	Natural causes.	In private life, virtuous, charitable and pious; as a sovereign, easy, kind and generous.	Lords Godolphin and Cowper—Earl of Oxford. Harcourt. Bolingbroke.	Duke of Marlboro'—Sir G. Rook, Ormund—Benbow.	Battles of Blenheim and Ramilies; Scotch union.
HOUSE OF HANOVER								
GEORGE I. (1660-1727).—Eldest son of Ernest Augustus, Duke of Brunswick, and Princess Sophia, daughter of Fredrick V., of Bohemia.	1714	54	13	Died of a a lethargic disorder, at Osnaburg.	Unostentatious and familiar; a circumspect general; a wise and virtuous prince.	Dukes of Newcastle and Devonshire. Lords Townsend and Carteret.	Earl of Mar. Duke of Argyle. Lord Cobham.	Insurrection in favor of the Pretender. Septennial parliament.
GEORGE II. (1683-1760).—Only son of George I., by Dorothy, daughter and heiress of the Duke of Zell.	1727	44	34	Died instantly, by a sudden rupture of the heart, while in good health.	Well-shaped, fair complexion; hasty, of moderate abilities, humane, liberal, temperate, and a scientific warrior.	Sir R. Walpole. Mr. Sandys. Earl of Huntington. Duke of Bedford.	Duke of Cumberland. Lord Anson. Earl of Stair. Gen. Wolfe.	New style introduced. Battles of Dettingen, Culloden, and Minden. Peace of Aix La Chapelle.
GEORGE III. (1738-1820).—Eldest son of Frederick and Augusta, Prince and Princess of Wales, and grandson of George II.	1760	22	59	By the gradual exhaustion of nature, having been in state of continual mental derangement for nine years.	His figure uniting strength and comeliness; his manners unassuming and liberal; hair light flaxen, eyes grey, eyebrows white, of moderate genius, and very pious.	Chatham. North, Pitt, Fox.	Rodney, Howe, Abercrombie—Nelson, Wellington.	French and American Revolutions. Union with Ireland. Battles of Leipsic and Waterloo.

TABLE OF SOVEREIGNS OF ENGLAND—Concluded

Names and Lineage of Sovereigns	Began to Reign	Years of Age	L'gth of Reign	Death	Character	Principal Statesmen	Chief Warriors	Events of Reign
HOUSE OF HANOVER—Continued								
GEORGE IV. (1762-1830).—Eldest son of George III., by his consort, Charlotte of Mecklenburg.	1820	58	9					
WILLIAM IV. (1765-1837).—Third son of George III.	1830	65	7	Natural causes.	A man of homely talents, immoral, tactless, but good hearted.	Lord John Russell, Robert Peel, Lord Melbourne.		Reform Bill passed by Parliament. Municipal Corporations Act. Establishment of the University of London.
Queen VICTORIA (1819-1901).—Daughter of Edward, fourth son of George III., and Victoria Maria Louisa, daughter of Francis, duke of Saxe-Coburg.	1837	18	64	Natural causes.	A sagacious ruler, jealous of her royal prerogative, persistent, self-devoted, but greatly beloved.	Lord Palmerston, Lord Derby, Disraeli, Gladstone, Rosebury, Salisbury.	Generals Gordon, Roberts, Kitchener.	Crimean war, Indian Mutiny, Zulu war, Boer war, Home Rule agitation. Australian Commonwealth bill. Imperialism strengthened. Marked literary achievements.
HOUSE OF SAXE-COBURG*								
EDWARD VII. (1841-1910).—Son of Victoria and Prince Albert of Saxe-Coburg and Gotha.	1901	60	9	Natural causes.	Lacked political training, but cultivated the arts of peace. Popular, but lacking in moral force.		Lord Roberts, General Kitchener.	King Edward and his Ministers were influential in establishing the Triple Entente, including England, France and Russia.
GEORGE V. (1865-——).—Son of Edward VII. and Queen Alexandra, daughter of Christian IX. of Denmark.	1910	45			Without political training; like his father, his foreign policy almost wholly in the hands of a powerful ministry. Personally a notable sportsman and popular.	Asquith, Lloyd-George, Cecil.	Kitchener, French, Haig.	England the leading and directing power of the Entente in the Great European war against the Germanic Allies.

FRANCE

Location and Extent.—France occupies the narrowest part of the great western peninsula of the European continent between the Mediterranean on the one side, and the Bay of Biscay and the English Channel on the other. As both coasts have many harbors, the situation between two seas is a very advantageous one. In extent it is fully three and a half times larger than England, measuring about six hundred miles each way across it.

Most of its frontiers are natural. On the south the high barrier of the Pyrenees rises between it and Spain; on the east the Alps and Jura separate it from Italy and Switzerland and part of the Vosges mountains forms the boundary towards Germany. On the northeast alone the political limit towards Germany and Belgium is artificially drawn, and has to be guarded by a line of fortresses.

Since 1768, France had held the Mediterranean island of *Corsica*, a rugged pyramid of forest-covered mountains.

Divisions of the Country.—Previous to the French Revolution, France was divided into *provinces*, which bore the names of the separate territories out of which the state had been gradually built up. These are accordingly of much greater historical interest than the present division into eighty-seven *departments*, which are almost universally named after the river basins in which they lie. The provincial names are also those which are still most in use in ordinary life in France. They are:

Alsace-Lorraine, a German crown land from 1871 to 1919, but returned to France by the Treaty of Versailles, 1919.

Ile de France, the original kernel of the state round Paris (*Departments*—Seine, Seine et Oise, Seine et Marne, Oise, Aisne).

Champagne (part of France since 1285) to the east of the former (Ardennes, Marne, Haute-Marne, Aube).

Lorraine (since 1766), east of Champagne (Meuse, Meurthe et Moselle, Vosges, and territory of Belfort).

Flanders (since 1677), on the border of Belgium (Nord).

Artois (since 1640), on the Channel (Pas de Calais).

Picardy (original), adjoining Ile de France on N. (Somme).

Normandy (since 1203), along the Channel (Seine-inferieure, Eure, Calvados, La Manche, Orne).

Brittany (since 1532), the western peninsula (Finistere, Morbihan, Cotes-du-Nord, Ille et Vilaine, Loire-inferieure).

Poitou (since 1375), southeast of Brittany (Vendee, Deux-Sevres, Vienne).

Anjou (since 1202) north of Poitou, across the Loire (Maine et Loire).

Maine (since 1202), between Anjou and Normandy (Mayenne, Sarthe).

Angoumois, Aunis and Saintonge (since 1242), south of Poitou, along the Bay of Biscay (Charente and Charente-inferieure).

Touraine (since 1256), across the Loire, east of Anjou (Indre et Loire).

Orleans (original), south of Ile de France (Loire et Cher, Eure et Loire, Loiret).

* Changed to House of Windsor after the beginning of the European War of 1914–1918.

NIVERNAIS (since 1707), southeast of Orleans (Nievre).
BOURBONNAIS (since 1559), south of Nivernais (Allier).
MARCHE (since 1531), southwest of Bourbonnais (Creuse).
BERRI (since 1100), between Marche and Orleans (Cher, Indre).
LIMOUSIN (since 1369), southwest of Marche (Haute-Vienne and Correze).
AUVERGNE (since 1531), west of Limousin (Cantal, Puy-de-Dome).
LYONNAIS (since 1307), northeast of Auvergne (Loire, Rhone).
BURGUNDY (since 1476), south of Champagne (Ain, Saone et Loire, Cote d'or, Yonne).
FRANCHE COMTE (since 1674), nearest Switzerland (Haute-Saone, Jura, Doubs).
DAUPHINE (since 1349), between the Alps and the Rhone Channel (Isere, Drome, Hautes, Alpes).
SAVOIE (since 1860), south of Lake of Geneva (Savoie, Haute-Savoie).
LANGUEDOC (since 1271), along the Mediterranean, west of the Rhone (Ardeche, Haute-Loire, Lozere, Gard, Herault, Tarn, Haute-Garonne, Aude).
GUYENNE (since 1453), in the basin of the Garonne, southwest (Aveyron, Lot, Dordogne, Tarn et Garonne, Lot et Garonne, Gironde).
GASCOGNE (since 1453), in the southwest, old *Aquitaine* (Landes, Gers, Hautes-Pyrenees).
BEARN and NAVARRE (since 1607) (Basses Pyrenees).
FOIX (since 1607) next Spain, in the south (Ariege).
ROUSSILLON (since 1642), in the southeast (Pyrenees-Orientales).
AVIGNON, VENNAISSIN, and ORANGE (since 1791), near the Rhone delta (Vaucluse).
PROVENCE, Roman PROVINCIA (since 1245), in the southeast along the Mediterranean (Bouches-Du-Rhone, Basses-Alpes, Var, Alpes-Maritimes).
CORSICA (since 1768), in the Mediterranean (Corse).

Surface and Mountains.—Within France the long curve of the *Cevennes Mountains* in the southeast, prolonged northward by the *Cote d'or*, the *Plateau of Langres*, and the *Vosges*, determines the slope of the country. Between them and the *Alps* lies the deep valley of the Rhone, with a southward fall to the Mediterranean. But these high lands, ramifying outward with gentler descent to north and west, give direction to the drainage of the longer slope to the Atlantic coast, the Bay of Biscay, the Channel, and the North Sea.

Mont Blanc, the highest point in Europe, rises within France, near the point of union of its boundary with that of Italy and Switzerland; the *Pic de Nethou*, the highest point of the Pyrenean barrier, stands just outside the boundary on the Spanish side; centrally in the country, the highest point is *Mont Dore*, in the volcanic group of the mountains of Auvergne, embraced by the curve of the Cevennes. The lowlands of France are not level plains like those of Belgium and Holland, but for the most part undulating districts; they lie along the Atlantic border (excepting where the heights of Normandy and Brittany run out into the ocean) and in the Mediterranean valley of the Rhone.

Chief Rivers.—The main direction of the drainage of France is from southeast to northwest over the long slope of land. The *Garonne*, receiving the numerous *gaves*, as the streams from the Pyrenees are called, and its tributary the *Dordogne*, from the mountains of Auvergne, forming the estuary of the *Gironde* in the south; the *Loire*, curving through the center of the country from the Cevennes to the Atlantic,—the longest river of France; the *Seine*, from the Cote d'or, flowing northwest to the English Channel; and the *Meuse*, from the Vosges, passing out to join the Rhine in the Netherlands. All are navigable, forming with their tributaries the natural waterways of France, which possesses a river navigation of about five thousand five hundred miles. The great southern river, the *Rhone*, from the mountains of Switzerland, receiving its chief tributary, the *Saone*, from the southern Vosges, is comparatively valueless to navigation from the rapidity of its current.

Climate and Soil.—Occupying a middle position between northern and southern Europe, France enjoys one of the finest climates of the continent. Toward the northeast it becomes more continental, toward the northwest more maritime and like that of southern England; in the warm south the hot winds from the African deserts may occasionally be felt, and in contrast to these, in the Rhone valley, the chilly northeast wind known as the *Mistral* at times descends from the Alpine Heights with great violence; but the greater part of the country is within the area of the westerly winds.

Products of Soil.—Very few parts of the country are unadapted for cultivation; only some parts of the Pyrenees, the Landes, and of the Vosges, can be thus characterized.

The destruction of natural timber in France within the past two centuries has been enormous. About a sixth part of the surface is wooded, the most extensive remaining forests being those of *Orleans* and *Fontainebleau*, between the northern curve of the Loire and Paris; of the hills of Var in the extreme southeast; and of the Jura and the Vosges. Much of the department of Vaucluse, in the lower valley of the Rhone, is covered with *Truffle oaks*, from about the roots of which enormous quantities of this fungus are obtained. The western promontory of Brittany is now barest of all, but here, as in the mountains of Auvergne, the Cevennes, the Pyrenees, and the Alps, replanting has begun.

The vine is grown in all parts of France excepting the northwestern departments; more than one thousand four hundred varieties of grapes are recognized; the finest growths being those of *Champagne* and *Burgundy* in the east, and of the basin of the Gironde (*Bordeaux*) in the southwest. Wheat, flax and beet-root for sugar, are the staple products of the north; olives of the extreme southeast. Apples and pears are widely grown in Normandy for cider and perry; oranges, citrons, and pomegranates come from the Mediterranean departments.

In pastoral wealth, in cattle and sheep rearing, France is far behind England and Germany in proportion to its extent.

Industries and Trade.—Agricultural and pastoral pursuits occupy the larger share of the people of France. The trade of the Cham-

pagne wine district centers at *Reims* and *Chalons-sur-Marne*, east of Paris; that of the Burgundy wines at *Dijon*, in the Saone valley, on the east; that of the Gironde wines, or claret, at *Bordeaux*, on the southwest. The subsidiary products of vinegar and brandy are made most largely, the one at *Orleans*, on the Loire, the other at *Cognac*, a small town on the Charente, north of Bordeaux.

The French People.—To the aboriginal *Iberian* and *Celtic* peoples of France came the *Romans* chiefly in the south and east; the descendants of this intermixture being the small dark and lively Frenchman of the south; in the north, in some degree, the Germanic element became interwoven; hence the Frenchman of the northern parts of the land partakes more of the character of his neighbors, is taller, blonde, blue-eyed, and less volatile than the southerner. Hence also the old division of the Romanized French language into the *Langue d'oc* (or Provençal) of the south; and the *Langue d'oil* (or Roman Walloon) of the north, from which the many dialects now spoken have descended.

The *Celtic* element remains almost pure in Brittany, and the *Iberian* in the *Basques* of the western Pyrenees. *Italians* appear in the southeast and in Corsica, *Flemings* on the Belgian frontier, and *Germans* toward Lorraine and Alsace, though, in this direction, the boundary drawn long the Vosges and round Lorraine since the war of 1871 follows as nearly as possible the meeting points of the German and French inhabitants of the northeast.

Religion and Education.—France is a Roman Catholic country. Protestants form but a small proportion, and the most numerous in the southwest between the Loire and the Pyrenees. Public education is entirely under the supervision of the Government, and no longer in the hands of the clergy. The percentage of illiterates is least in the districts which lie nearest to Germany, and greatest in the Atlantic coast-lands of the west and southwest.

There are state universities at Aix, Algiers, Angers, Bordeaux, Caen, Clermont, Dijon, Grenoble, Lille, Lyon, Marseilles, Montauban, Montpelier, Nancy, Nantes, Paris, Poitiers Rennes, Strasbourg, and Toulouse.

Cities and Towns.—More than 8,000,000 people live in the seventy-one chief cities. Fifteen cities have populations of more than 100,000:

Paris	2,888,110	St. Etienne	148,656
Marseilles	550,619	Nice	142,940
Lyon	523,796	Le Havre	136,159
Bordeaux	261,678	Rouen	124,987
Lille	217,807	Roubaix	122,723
Strasbourg	178,913	Nancy	119,949
Nantes	170,535	Rheims	115,178
Toulouse	149,576	Toulon	104,582

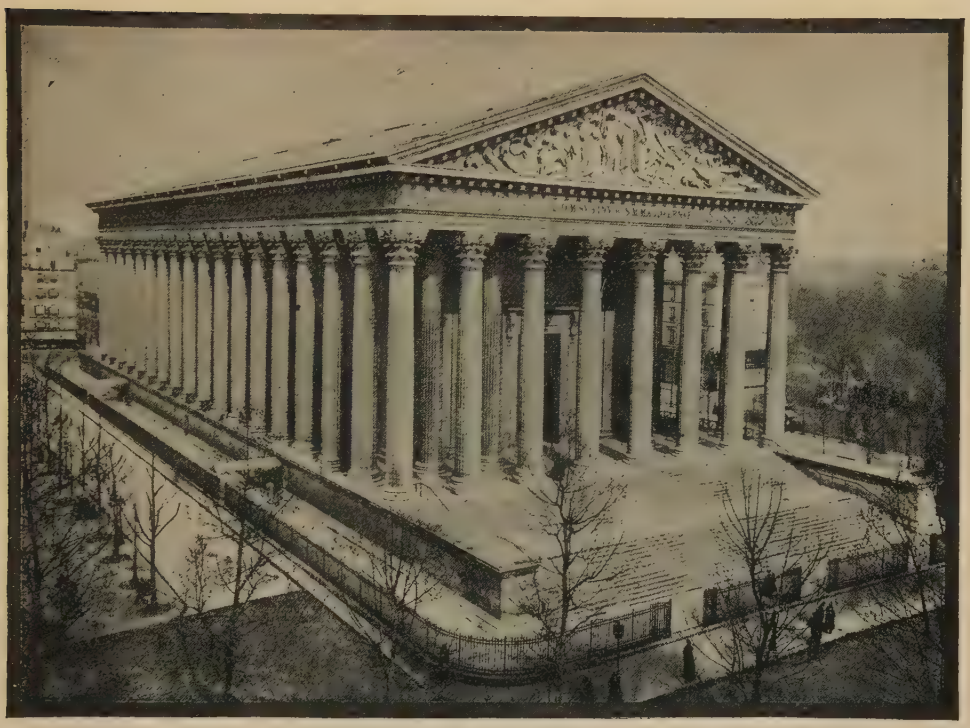
Twenty-two others exceed 50,000 inhabitants.

PLACE DE LA CONCORDE, PARIS, UNDER GIANT SEARCHLIGHTS

Paris (Fr. pron. *Par-ee'*), capital of France, and the largest city in Europe after London, is situated on the river Seine, about one hundred and ten miles from its mouth. It lies in the midst of the fertile plain of the Ilede-France, at a point to which converge the chief tributaries of the river, the Yonne, the Marne, and the Oise; and is the center of a great network of rivers, canals, roads, and railways.

France has long been the most highly centralized country in Europe, and Paris as its heart contains a great population of government functionaries. It is a metropolis of pleasure, and attracts the wealthy from all parts of the world; hence it is a city of capitalists and a great financial center.

THE SEINE AND ITS BRIDGES.—The Seine divides the city into two parts, and forms the islands of La Cite and St. Louis, both covered with buildings. This river is navigable by small steamers. The quays or embankments, which extend along its banks on both sides, are built of solid masonry, protect the city from inundation and form excellent promenades. The Seine, within the city, is fully five hundred



THE MADELEINE, PARIS

This splendid edifice, begun in 1764, is modeled after the Parthenon at Athens. In 1806, Napoleon decreed its completion for a Temple of Glory. Louis XVIII. proposed converting it into an expiatory chapel to Louis XVI. and XVII. and Marie Antoinette. It was completed, 1842, at a cost of nearly $3,000,000.

and thirty feet in width, and is crossed by numerous bridges, the more important being Pont Neuf, Pont de la Concorde, Pont Alexandre III., Pont d'Iena, and the Pont de l'Alma.

Environs and Fortifications.—Paris is surrounded by a line of fortifications twenty-five miles long; outside of this is a chain of fortresses, while beyond that again are the detached forts. These form the two main lines of defense. The inner line consists of sixteen forts, the outer line of eighteen forts besides redoubts; the area thus inclosed measuring four hundred and thirty square miles, with an encircling line of seventy-seven miles.

Montmartre, within the fortifications is four hundred feet high; the city is encircled at a distance of from two to five miles by an outer range of heights, including Villejuif, Meudon, St. Cloud, and Mont-Valerien (six hundred and fifty feet), some of which are crowned by the detached forts which now form the main defenses of the city. At the fifty-six gates in the walls of Paris are paid the octroi dues.

Streets and Boulevards.—The houses of Paris are almost all built of white calcareous stone, and their general height is from five to six stories, arranged in separate tenements. Many of the modern street buildings have mansard roofs, and are highly enriched in the renaissance manner. In the older parts of the city the streets are narrow and irregular, but in the newer districts the avenues are straight, wide, and well-paved.

The central point of the city is Place Royal, along which passes the great thoroughfare of the city from southeast to northwest. Beginning at the Place de la Nation, at the southeast margin of the city, this grand avenue, from Place de la Nation to Place de la Bastille, is called *Rue du Faubourg St. Antoine;* from Place Bastille to near Hotel de Ville it is called *Rue St. Antoine;* from Hotel de Ville, past the Louvre, to Place de la Concorde, *Rue de Rivoli;* from Place de la Concorde to the Arc de Triomphe, *Avenue des Champs Elysees;* and beyond the Arch, *Ave. de la Grande Armee.*

The Center of Parisian Life.—That which is specifically called *The Boulevard* extends in an irregular arc on the north side of the Seine, from the Place de la Bastille in the east to the Place de la Madeleine in the west and it includes the Boulevards du Temple, St. Martin, St. Denis, des Italiens, Capuchins, and Madeleine, and its length is nearly three miles. Here may be noted also the triumphal arches of the Porte St. Denis and the Porte St. Martin, the former of which is seventy-two feet in height.

On the south side of the Seine the boulevards are neither so numerous nor so extensive, the best-known being the Boulevard St. Germain, which extends from the Pont Sully to the Pont de la Concorde.

After the boulevards among the best streets are the great new streets formed in the time of Napoleon III. are the Rue de Rivoli, two miles in length, the Rue de la Paix, the Rue du Faubourg St. Honore, the Rue Royale and twelve fine avenues radiating from the Place de l'Etoile.

Squares and Parks.—The most notable public squares or *places* are the Place de la Concorde, one of the largest and most elegant squares in Europe, adorned by an Egyptian obelisk, fountains, and statues; Place de l'Etoile, in which is situated the Arc de Triomphe, a splendid struc-

A REMARKABLY INFORMING PANORAMA OF PARIS AND IMMEDIATE SUBURBS, SHOWING AS WELL AS THE LOCATION AND ARCHITECTURAL OUT-

THE PLAN OF THE CITY, THE COURSE OF THE RIVER SEINE, CHIEF BOULEVARDS AND STREETS, LINES OF THE PRINCIPAL BUILDINGS AND MONUMENTS.

ture one hundred and fifty-two feet in height; the Place Vendôme with column to Napoleon I.; Place des Victoires, with equestrian statue of Louis XIV.; Place de la Bastille, with the Column of July; Place de la Republique, with colossal statue of the Republic.

Within the city also are situated the gardens of the Tuileries, which are adorned with numerous statues and fountains; the gardens of the Luxembourg, in which are fine conservatories of rare plants; the Jardin des Plantes, in which are the botanical and zoological gardens, hothouses and museums, which have made this scientific institution famous; the Buttes-Chaumont Gardens, in which an extensive old quarry has been turned to good account in enhancing the beauty of the situation; the Parc Monceaux; and the Champs Elysees, the latter being a favorite promenade of all classes.

ARC DE TRIOMPHE (ARCH OF TRIUMPH), PARIS

But the most extensive parks are outside the city. Of these the Bois de Boulogne, on the west, covers an area of two thousand one hundred and fifty acres, gives an extensive view toward St. Cloud and Mont Valérien, comprises the racecourses of Longchamps and Auteuil, and in it are lakes, cascades, ornamental cafes, and the Jardin d'Acclimatation.

TROCADERO PALACE, PARIS

Built for the Exhibition of 1878, the Trocadero contains a fine collection of architectural and monumental casts. The building affords some of the finest views of Paris.

The Bois de Vincennes, on the east, even larger, is similarly adorned with artificial lakes and streams, and its high plateau offers a fine view over the surrounding country.

The most celebrated and extensive cemetery in Paris is Pére la Chaise (one hundred and six and one-half acres), finely situated and containing the tombs of many celebrities. The Catacombs are ancient quarries which extend under a portion of the southern part of the city, and in them are deposited the bones removed from old cemeteries now built over.

CATHEDRALS AND CHURCHES.—Of the churches of Paris the most celebrated is the Cathedral of Notre Dame, situated on one of the islands of the Seine, called the Île de la Cité. It is a vast cruciform structure, with a lofty west front flanked by two square towers, the walls sustained by many flying-buttresses, and the eastern end octagonal.

The church of La Madeleine, a modern structure in the style of a great Roman temple, with a peristyle of lofty Corinthian columns, stands on an elevated basement fronting the north end of the Rue Royale. It is considered by many to be the most beautiful edifice in Paris.

The Pantheon, or church of St. Geneviève, patron saint of Paris (1764) was begun as a church, but converted by the Constituent Assembly into a temple dedicated to the great men of the nation. Napoleon III. restored it to the church and rededicated it to St. Geneviève, but once more, on the occasion of the funeral of Victor Hugo (1885), it was reconverted into a valhalla. There are the tombs also of Voltaire, Rousseau, Marat and Victor Hugo.

St. Eustache (1532-1637) is an interesting example of French Renaissance architecture; and others worthy of note are: St. Germain l'Auxerrois; St. Gervais; St. Roch; St. Sulpice; Notre Dame de Lorette; and St. Vincent de Paul. On the very summit of Montmartre is the Church of the Sacred Heart, a vast new structure in the Byzantine style which cost over five million dollars. The chief French Protestant churches are the Oratoire and Rédemption. There are several English, Scotch, and American churches, a Russian Greek church, and several synagogues.

THE PANTHEON, PARIS

It occupies a most commanding position near the Luxembourg Palace, and is one of the finest architectural structures of the city.

PALACE OF JUSTICE, PARIS

The Sainte Chapelle, in the south court of the Palais of Justice is the most beautiful example of Gothic in Paris.

PALACES AND PUBLIC BUILDINGS.—Notable among the public buildings of Paris are its palaces.

The Louvre, a great series of buildings within which are two large courts, is now devoted to a museum which comprises splendid collections of sculpture, paintings, engravings, bronzes, pottery, Egyptian and Assyrian antiquities. The *Venus de Milo*, the *Fettered Slaves* of Michael Angelo the *Mona Lisa* of Leonardo da Vinci, and a noble group of the works of Raphael, Titian, and Veronese are the chief treasures. In one gallery there are twenty-one large pictures by Rubens. The *Salon Carré* contains the most striking works of art.

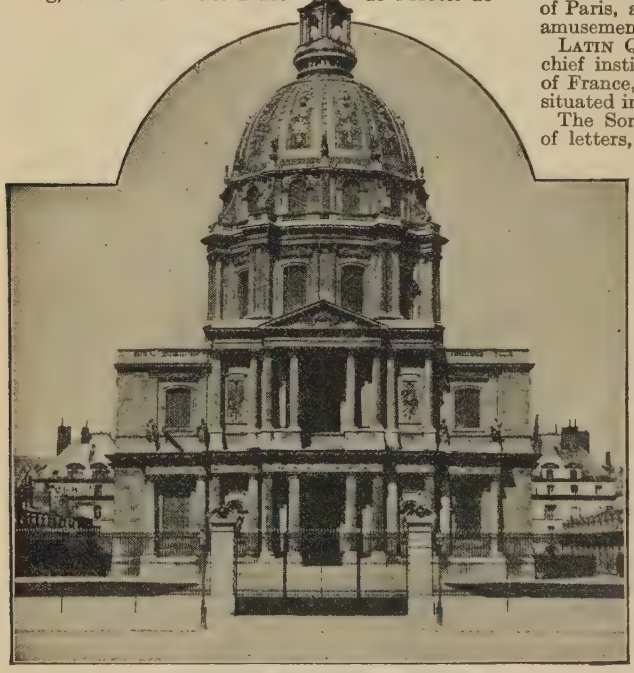
The palace of the Tuileries was set on fire in 1871 by the Communists. The ruins have been removed, but a few of the architectural details have been preserved.

The Palace of the Luxembourg, south of the Seine, since 1879 the meeting-place of the French senate, was built by Marie de Médicis in the Florentine style. Close to it a gallery has been

constructed for the reception of the works of living artists acquired by the state.

The Palais de l'Élysée, situated in the Rue St. Honoré, with a large garden, is now the residence of the president of the re public. The Chambre des Députés— known under the Empire as the Palais du Corps Législa- tif—is the building in which the deputies meet.

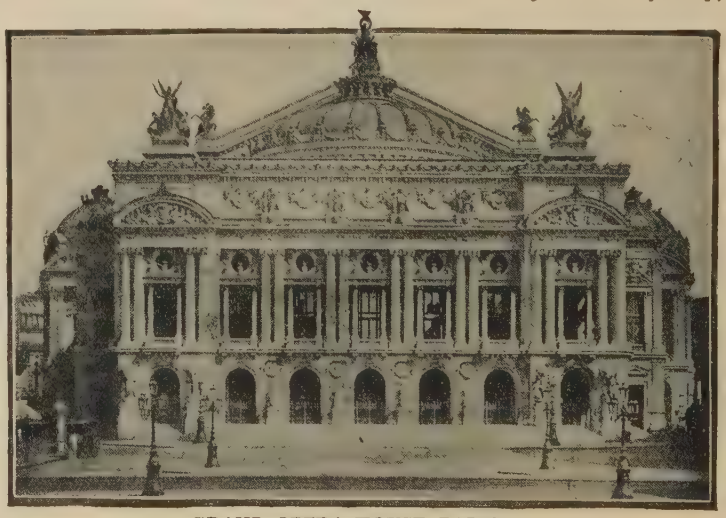
The Hôtel de Ville, or mun icipal build- ing, is situated in the Place de l'Hôtel de Ville, formerly Place de Grève, on the right bank of the river. It was destroyed by the communists in 1871, but has now been re-erected on the same site with even greater magnificence. It is a very rich example of Renaissance architecture.



HOTEL DES INVALIDES, PARIS
Prepared as a tomb for Napoleon by Louis Philippe.

The Hôtel des Invalides, built in 1670, is now used as a retreat for disabled soldiers, and is capable of accommodating five thousand. The church attached has a lofty and finely-proportioned dome. It contains the burial-place of the first Napoleon.

The Palais de Justice is an irregular mass of buildings occupying the greater part of the western extremity of the Île de la Cité. Opposite the Palais de Justice is the Tribunal de Commerce, a quadrangular building inclosing a large court roofed with glass. The mint (Hôtel des Monnaies) fronts the Quai Conti, on the south side of the Seine, and contains an immense collection of coins and medals.



GRAND OPERA HOUSE, PARIS
This is the finest building of its class in the world.

Theaters and Places of Amusement.—Paris has numerous theaters. The leading houses are the Opéra, the Théâtre Français—chiefly devoted to classical French drama—the Opéra Comique and the Odéon, which receive a subvention from government. The new opera house, completed in 1875, cost, exclusive of the site, five million, six hundred thousand dollars.

Montmartre is the center of the bohemian life of Paris, and contains many *cafés* and places of amusement. It has upwards of forty theaters.

Latin Quarter and Its Institutions.—The chief institutions connected with the University of France, and with education generally, are still situated in the Quatier Latin.

The Sorbonne, the seat of the Paris faculties of letters, science, and Protestant theology, has been rebuilt and increased in size. The Sorbonne contains lecture-halls and class-rooms, and an extensive library open to the public. There gratuitous lectures are given and degrees are granted by the University of France.

Near the Sorbonne is the Collège de France, where gratuitous lectures are also delivered by eminent scholars and men of letters, as well as a large number of colleges and lycées, the great public schools of France for secondary instruction.

The Ecole Polytechnique, the School of Medicine and the School of Law, the Observatory, and the Jardin des Plantes, with its great museums of natural history, are situated in the same quarter of Paris.

The principal public library is Bibliothèque Nationale, which originated in a small collection of the books placed by Louis XI. in the Louvre.

Industries of Paris.—Paris cannot be described as a manufacturing town. Its chief and peculiar industries produce articles which derive their value not from the cost of the material, but from the skill and taste bestowed on them by individual workmen They include jewelry, bronzes, artistic furniture, and decorative articles known as *articles de Paris*. In consequence of

the intelligence and taste required in their trades the Paris workmen are in many respects superior to the machine hands of manufacturing cities.

Versailles (*vêr-sālz'* Fr. pron. *ver-säy'*), is situated eleven miles west-southwest of Paris. It contains a famous royal palace, a great part of which is now occupied by the Museum of French History, consisting of paintings; but some of the apartments are still preserved with the fittings of a royal residence. The chapel is well proportioned and sumptuous. The great gallery, called the Galerie des Glaces, is one of the finest rooms existing; it is two hundred and forty by thirty-five feet, and forty-two feet high, adorned with mirrors and gilding, and with ceiling-paintings by Lebrun representing the triumphs of Louis XIV.

STAIRWAY OF HONOR, GRAND OPERA HOUSE

Here King William of Prussia was proclaimed German emperor in 1871, and, in 1919, the Treaty of Versailles, closing the great European war, was signed. The council-chamber, the bedroom of Louis XIV., and the theater are all historic and highly interesting.

The gardens are the finest of their kind. They abound with monumental fountains profusely adorned with groups of sculpture, and supplied the model for those of half the palaces of Europe.

THE EIFFEL TOWER

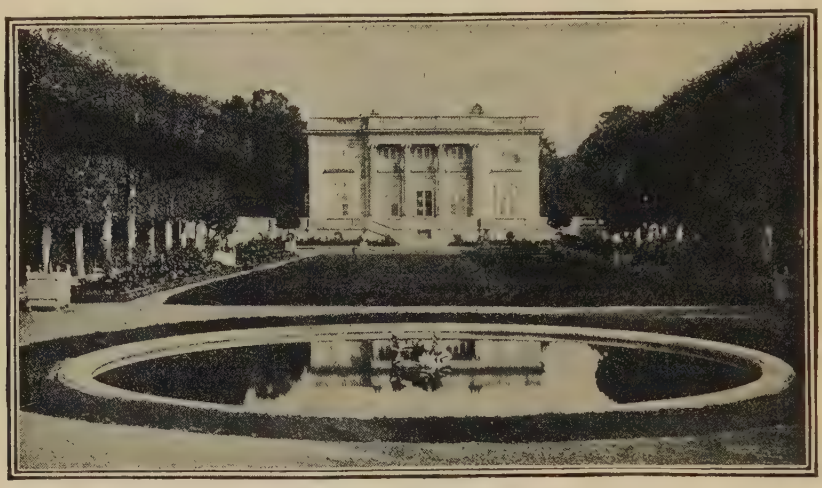
Contains three stories, reached by a series of elevators. The platform at the summit is nine hundred and eighty-five feet above the ground. It cost about one million dollars.

St. Denis (*saṅ-dē-nē'*), two and one-half miles north of the fortifications of Paris, is chiefly notable for its abbey church, the historic burial-place of the kings of France. Dagobert built the church, which was the nucleus of one begun by Pepin, finished by Charlemagne in 775, and demolished and a larger one built on its ruins four hundred years later. During the Revolution the church was pillaged. It was restored by Viollet-le-Duc. Here Charlemagne was anointed; the Oriflamme was kept; Abélard dwelt; Joan of Arc hung up her arms; Henri IV. abjured Protestantism; and Napoleon I. was married to Marie Louise. The bones of the kings of France from Dagobert (630) to Louis XV. (1774) were buried here; and the mad Revolutionists tore them from their tombs, and buried them in a common ditch. They are now in the crypt, and superb royal monuments adorn the church, whose interior is lighted by splendid stained windows, and enriched with mosaics and statuary.

Among the monuments of greatest interest are those of Frédégonde, Dagobert, Pepin, Charlemagne, Clovis II., Charles Martel, Henry II., Catherine de Médicis, Francis I., Louis XVI., Marie Antoinette, Henry IV., Louis XII., and Louis XIV.

Of the 167 sepulchral monuments, 53 are new or were brought from other churches. In 1817, Louis XVIII. caused the remains of Louis XVI. to be removed from the Madeline cemetery to St. Denis.

Fontainebleau (*Fong'tehn-blō'*), near the Seine's left bank, thirty-seven miles southwest of Paris, is chiefly famous for its royal château, and the beautiful forest that surrounds it. The château, said to have been founded by Robert the Good toward the end of the tenth century, was rebuilt in 1169 by Louis VII., and enlarged by Louis XI. and his successors. After being allowed to fall into decay, it was repaired and embellished by Francis I., Henry IV., Napoleon I., and Louis-Philippe.



PETIT TRIANON, VERSAILLES

This beautiful little palace was the favorite residence of the unfortunate Marie Antoinette, after Louis XVI. came to the throne of France. Is is now a museum of the personel relics of this beautiful and ill-fated Queen.

Barbizon (*Bar-bee-song'*), is close to the Forest of Fontainebleau. It is a great artists' resort, and was the home and death-place of Millet. Corot, Diaz, Daubigny, and Rousseau were other members of the "Barbizon School" of painters.

Chief Industrial Centers.—Textile manufactures are the most important of the mechanical industries of France.

Lyons, the third city of France, at the junction of the Sôane with the Rhone, is the center of the silk-growing region and the metropolis of the *silk manufactures*, in which the country stands unrivalled. *St. Etienne* (146,000), southwest of Lyons, comes second to it in this manufacture, after which come *Nimes*, near the delta of the Rhone, *Tours*, on the Loire, and *Paris*. Inland trade and manufactures in the south are most active at ancient *Toulouse*, on the Garonne, and at *Montpellier*, near the Rhone delta.

Woolen, linen, and cotton manufactures are almost entirely confined to the northern region. Foremost among these manufacturing towns of the north stands *Lille*, with its neighbor towns of *Roubaix* and *Tourcoing*, still nearer the Belgian manufacturing region; and *Cambrai*, *Douai*, *Valenciennes*, and *St. Quentin*, southeast of it. *Rouen*, on the Seine in Normandy, and *Amiens*, on the Sommer, between Rouen and Lille, *Reims*, in the Champagne district, *Sedan*, on the Ardennes and *Nancy*, in French Lorraine, still farther east, are the other chief manufacturing towns of the northern region.

At *Sèvres*, southwest of Paris, are the chief *porcelain* factories, which give the models and take the lead in this industry. *Limoges* is also a noted center of porcelain manufacture.

Glass is very extensively made in the northern departments. Paris itself excels in every kind of luxurious and fanciful manufacture. *Besançon*, the largest town near the frontier of Switzerland, is a great depot for the produce of the French half of that country, and manufactures watches largely.

The mining industries of France are comparatively limited. *Coal* is drawn chiefly from the *basin of Valenciennes*, which continues the Belgian coalfield on the north, from the basin of the Loire and Rhone, and from that of *Creuzot*, on the south of the heights of the Côte d'or. Iron occurs in eleven districts and is of excellent quality, but generally lies distant from the fuel necessary to smelt it, so that this metal must also be imported in large quantity. *St. Etienne*, southwest of Lyons, is the most noted center of the French hardware manufactures, especially of guns and machinery; *Le Creuzot*, in the midst of its coal basin, has also noted ironworks.

The trade of France is only inferior to that of Britain, Germany, and the United States; the position of the country, with coasts on three of the most frequented seas, is exceedingly favorable to its commerce. The great seats of maritime traffic with all the world are *Marseilles*, on the Mediterranean coast; *Bordeaux* and *Nantes*, with *St. Nazaire*, on the coast of the Bay of Biscay; *Le Harve* (at the mouth of the Seine), *Boulogne*, *Calais*, and *Dunkerque*, on the English Channel. All of these may in a sense be called the harbors of the central point of the life of the state, luxurious *Paris*.

Naval and Military Centers.—The naval arsenals of France, dockyards, and stations of the fleet, are at *Cherbourg* and *Brest*, on the northwest coast; *L'Orient* and *Rochefort* (south of La Rochelle) on the Bay of Biscay; and *Toulon*, on the Mediterranean. *Nice* and *Cannes*, on the Riviera, are favorite winter resorts.

France has more than one hundred fortified places; indeed almost every town along the northern and northeastern border is a fortress. *Briançon*, the highest town in the country, in the Alps, south of the pass of Mont Cenis into Italy, is the chief arsenal and depot of this mountain barrier, and is considered impregnable.

HISTORY

The name France first appears in history about the ninth century. Prior to that time the country which constitutes the greater part of modern France was occupied successively by Celts, Gauls and Franks.

Under the Romans.—When first known this country was called Gallia, and was the center whence swarms of plunderers poured over the mountains into Italy; but the Phœnicians and Greeks had a few trading cities on the Mediterranean coast—especially Marseilles—where in the seaport towns traces of descent from the Greeks are said still to be found.

In 125 B. C. the Romans formed in the east of the Rhone a settlement ever since called Provincia or "the Province," whose capital was Aquae Sextiae (now Aix), and where corrupted Latin has never ceased to be the dialect, and their power and influence gradually spread. Between 58 and 51 B. C. Julius Caesar subdued the whole of Gaul, except the granite peninsula of the northwest. Later, refugees from Britain caused it to be called Brittany; and there to the present day the Celtic tongue has prevailed, and the habits have been peculiar. The Iberian or Basque tribes of the Pyrenees have likewise preserved their entirely different tongue, which is not even Aryan.

The Impress of Roman Rule.—Roman habits, civilization and speech were adopted all over the country, and Christianity became nearly universal. Many cities were founded as centers of government from the conquered population, and most of the great cities such as Arles and Lyons and many others date from this time. Nimes and Vienne show splendid monuments of Roman architecture. The Romans also made magnificent roads, and are said to have introduced the olive and the vine, to both of which the climate is eminently suitable.

Under Teutonic Invaders.—Continual warfare on the open frontier soon began between the Roman legions and the advancing Teutonic nations, of whom the Belgians, a mixed race, were the van. The city of Lutetia Parisiorum, now known by its tribal name, Paris, was the headquarters of Emperor Julian before his accession in A.D. 361, while he was struggling with these invaders. After his death, Gaul became a prey to the Teutons. They did not destroy the old population, but quartered themselves as guests on the proprietors of land; while the Roman cities kept up their self-government, and paid ransoms to escape pillage. Chief of these Teutonic tribes were the Goths, Burgundians and Franks.

Merovingians.—The Franks, whose dominion swallowed up those of both the foregoing tribes, had been long settled in the north; and Pharamond, their chief in 420, is considered the founder of the French monarchy, as he was of the first or Merovingian race of Frankish kings. In 485 Clovis defeated Syagrius, the Roman general, at Soissons, and finally extinguished the Roman power in the west, and in 507, by his victory over the Visigoths, he rendered himself master of the country between the Loire and Garonne, but was checked at Arles by Theodoric, king of the Ostrogoths. He then settled in Paris, where he died. His chief aim was a united Frankish kingdom.

Clovis in 493 married Clotilda, a Christian Burgundian princess, and in 496 embraced her faith.

AMIENS CATHEDRAL

The most perfect specimen of Gothic architecture in France, dating from the thirteenth century. This splendid structure is embellished with a wealth of magnificent mediæval sculpture. Viollet-le-Duc happily calls this cathedral "the Parthenon of Gothic architecture."

Though nominally Christians, the Franks brought their old hereditary Teuton customs of inheritance and chieftianship, which, as they had last come from the banks of the Yssel, were known as Salic laws—*i.e.* of the Salian Franks. Their German dominions were called Austreich (the eastern kingdom); their Gaulish Neaustreich (not Eastern) or Neustria; and both were Frankland. Their dynasty soon exhausted itself, and latterly their kings were called *Fainéants* or "Do-nothing" kings while the mayors of the palace really governed.

Carlovingians.—One of the mayors, a Teuton wholly in blood, Charles Martel, in 721 checked the tide of Saracen invasion, and saved Gaul by the great battle of Soissons. His son, Pepin, in 753 was elected king, and thence descended the line known as Carlovingians. Under Pepin and Charles the Great, called by the French "Charlemagne," the country was relatively peaceful and prosperous; but after the latter's death things returned to their original state of confusion.

Charlemagne was one of the really great monarchs of the world. His dominions reached from the Ebro to the Channel, from the Elbe to the Atlantic, and included North Italy, and in 800 he was crowned by the Pope Emperor of the West. His power was too vast for a single hand of less power, and fell to pieces after his son's death. The Western Franks fell to Charles the Bald, and it was then (about 870) that France became a recognized term for the country between the Channel and the Pyrenees.

The king had, however, very little power; his lands were cut up into divisions under dukes, marquises, and counts, who simply paid him a nominal homage, and were bound to follow him in war, but who ruled quite independently. Moreover, the Northmen or Normans were horribly ravaging the whole country; Paris was fortified against them under Robert the Strong, but, in 911, Charles the Simple found himself obliged to make to Rolla, the chief of the Northmen invaders, a grant of the Neustrian lands, which took the name of Normandy. The Carlovingians finally were deposed in 987, and their last sovereign, Louis V., retired to Lotharingia or Lorraine as duke.

Capetians.—The grandson of Robert the Strong, Hugh, became king. He was called Capet, apparently from the hood which marked him as guardian of the Abbey of St. Denis; and the name is used for his dynasty, which reigned for eight hundred years.

The German influences had passed away, though the king and nobility were of Frankish blood. The whole realm was parcelled out into feudal holdings, the great chiefs of which hardly owned the royal power, and the only place where the king really ruled directly was the county of Paris. There was much confusion and private warfare, and after the conquest of England in 1066, the Dukes of Normandy overshadowed the French kings.

Louis IV. ("the Fat"), in 1108, was the first king of any ability. He judicially overcame a robber count, and in his time (though not on any fixed principles) cities began to be allowed to purchase their power of self-government, such as the southern one had preserved from Roman times. This was called the right of *commune*. Except in these cities, the lot of the people of Gallo-Roman blood was wretched. They were called villeins, and, except that they were attached to the soil, were almost slaves, cruelly oppressed and downtrodden by their irresponsible lords, mostly Franks, who covered the land with fortified castles. There was, however, much religious zeal, which found its outlet in the Crusades, first proclaimed at Clermont, in Auvergne, in 1095, and in the religious orders, whose beautiful monasteries and splendid cathedrals still exist.

France was at its weakest under Louis VII., when Henry II. of England, by inheritance Duke of Normandy and Count of Anjou, had married the heiress of the great Duchy of Aquitaine, and obtained the heiress of Brittany for his son. Philip II., called Augustus, spent his life in undermining the power of the English kings, and when King John murdered his nephew Arthur of Brittany, Philip held a court of justice, cited him thither, and, on his non-appearance, adjudged him to have forfeited Normandy and Anjou, which easily were conquered, leaving only Aquitaine as the possession of John's mother, and these lands, being held direct of the crown, much added to the royal power.

Under Louis IX.—The king, Louis IX., was the best and most blameless of French sovereigns. It was he who, in 1258, established the Parliament of Paris. In every Teuton nation the king was supposed to take counsel and do justice among the other nobles and freemen; but to attend courts of law in a large territory was a great vexation to the nobles, who would not come, and yet resented decisions made in their absence. Louis arranged that though every immediate vassal of the crown had a right to sit in it, yet in its working state it should only consist of men trained in the law, with just nobles enough to give authority. In this parliament the wills and edicts of the king, and the taxes he imposed, were registered. The provinces, likewise, had parliaments to serve as courts of law. Louis's devotion led him to attempt two unfortunate crusades, and he died in the second, in 1270.

His grandson Philip IV. ("the Fair"), had a desperate quarrel with the Papacy, and by underhand means succeeded in forcing Pope Clement V. to reside in his dominions. The Popes fixed their residence at Avignon, in Provence, a province belonging to the Empire, and held at the time by Philip's uncle, Charles, Count of Anjou, but near enough for French influence. Here the Papal court continued for seventy years. Philip V. was a violent and unscrupulous man, and the three sons who reigned in succession after him had not his force of character.

Philip was succeeded in turn by Louis X., Philip V., and Charles IV. The rivalry between France and England, consequent upon the accession of Duke William of Normandy to the throne of the latter, came to a decisive crisis during the first half of the fourteenth century.

House of Valois and the "Hundred Years' War."—On the death of Charles IV. (1328) Philip of Valois succeeded to the throne, beginning the Valois dynasty; but Edward III. of England, by virtue of hereditary right derived from his mother's side, claimed not only such provinces as had been taken from his ancestors, but the whole kingdom. In this way began the protracted conflict which French historians call the "hundred years' war" (1337-1453), a period covering the reigns of John II. (1350-1364), Charles V. (1364-1380), Charles VI. (1380-1422), and the greater part of the reign of Charles VII. (1422-1461). In 1340 an English fleet destroyed the naval force of France at Sluis, on the coast of Flanders; in 1346, at Crécy, the English archers overcame the flower of French chivalry; and at Poitiers (1356) the Black Prince defeated King John and made him prisoner.

The States-General were also the scene of a deadly struggle between the regent and the third estate, and the peasantry of several districts broke out into a fearful insurrection, which was named the *Jacquerie*, and marked by all the horrors of a servile war. Charles V., with the help of his great constable, Du Guesclin, regained in a few campaigns almost all the English acquisitions in France. On his death, in 1380, his son Charles VI., surnamed the *Well-Beloved*, ascended the throne.

The reign of this sovereign was signally unfortunate. He fell into a state of insanity, which rendered him incapable of attending to the administration of the government, and in conquence regents were appointed, whose misconduct threw the kingdom into a civil war. During these calamities which afflicted France, Henry V. of England invaded the country, and gained the memorable battle of Agincourt. The consequence of this victory, and other advantages gained by Henry, enabled him to conclude a treaty by which his succession to the throne of France was acknowledged on the death of Charles. Henry and Charles both died shortly after this event, A. D. 1422.

Charles VII. and Joan of Arc.—Charles VII., surnamed the *Victorious*, asserted his right to the throne of his father, while at the same time the infant Henry VI. of England was proclaimed King of France under the regency of his uncle, the Duke of Bedford. The English laid siege to Orleans, a place of the greatest importance, and so successful were they in their operations against this and other places that the affairs of France began to wear a most gloomy aspect. The tide of misfortune, however, was successfully turned by one of the most extraordinary events recorded in history.

When the hope of saving Orleans was almost abandoned, a young girl named Joan of Arc, about seventeen years of age, who had lived an humble life in a village on the borders of Lorraine, presented herself to the Governor of Vaucouleur, and maintained with much earnestness that she had been sent by Divine commission to raise the siege of that city, and procure the coronation of Charles in the city of Rheims.

After undergoing a most rigid examination before a committee of persons appointed for that purpose, and also before the court and the king himself, she was intrusted with the liberation of Orleans. As she approached the city her presence inspired the inhabitants with confidence, while it spread dismay and consternation among the English, who hastily raised the siege and retired with precipitation, but being pursued by the heroine at the head of the French army, they were entirely defeated at Patay, with a loss of nearly five thousand men, while the French lost only one of their number. From this event Joan was called the Maid of Orleans.

The second part of her mission, which yet remained to be accomplished, was equally arduous and dangerous. The city of Rheims and the intermediate country being in possession of the English or their allies, presented apparently insurmountable difficulties. Charles, however, placing full confidence in her guidance, commenced his march, and as he advanced every obstacle disappeared; the citizens of Rheims, having expelled the garrison, received him with every demonstration of joy. After the coronation was performed, Joan threw herself at the feet of Charles, declaring that her commission was accomplished, and solicited leave to return to her former humble station; but the king, unwilling to part with her services so soon, requested her to remain for some time with the army, with which at length she complied. She afterwards attempted to raise the siege of the city of Campiegne; but her good fortune seemed to have deserted her; she fell into the hands of the English, who, to gratify their revenge for the many losses they sustained through her valour, condemned her, under a charge of various pretended crimes, and caused her to be burned in the public square at Rouen.

By this cruel measure the English hoped to check the success that had attended the operations of Charles. In this they were disappointed; such was the impulse which the heroine had given to the affairs of France, that the English in a few years were expelled from all their possession in the country, with the exception of Calais.

Charles passed the remainder of his reign in improving the internal condition of his kingdom. The close of his life was embittered by the unnatural conduct of his son, who attempted to poison his father. He died in 1464, a prince of acknowledged virtue, justice and discretion.

Louis XI. (1461-1483), the son and successor of Charles VII., annexed Burgundy and Picardy, and acquired Anjou, Maine, Provence, and the counties of Rousillon and Cerdagne; and France thus became one of the great powers on the Mediterranean. On the northwest, by the marriage of Charles VIII. with Anne of Brittany, she gained possession of that large province. Charles VIII. invaded Italy in 1494, and this was the first of a long series of Italian wars in which France was engaged for more than half a century. With Charles VIII., who died in 1498, the direct line of Valois ended, and Louis, duke of

Orleans, grandson to a brother of Charles VI., became king under the title of Louis XII. He met at first with some success in Italy, but was at last driven out.

Wars of Francis I. and Charles V. of Germany.—Francis I. (1515-1547), his successor, being opposed by the emperor Charles V., of Germany, suffered a disastrous defeat at Pavia in 1525, and was carried a prisoner to Madrid, where in 1526 he agreed to a treaty by which he forfeited Burgundy, and all claims to Naples, Milan, Tournay, and Arras. No sooner was he set at liberty than he secured from the pope a release from his oaths, and renewed the struggle, but again with unfavorable results, and was compelled to make another disastrous peace at Cambrai (1529).

The Reformation had now begun, and Charles V. was obliged to turn his attention to Germany. Francis encouraged the Protestant princes in their opposition to the emperor, and in 1536 the war again broke out. It was ended in 1544 by the peace of Crespy, when the emperor was threatening Paris.

Francis I. died in 1546, and was succeeded by his son, Henry II., and the struggle soon began again. Henry recovered Calais for France. Under Francis II. (1559-1560) the Roman Catholic House of Guise obtained possession of the effective power in the state. Their adversaries, the House of Bourbon, headed the movement of the reformers. Under the weak kings Charles IX. (1560-1574) and Henry III. (1574-1589), who were under the influence of their mother, Catherine de' Medici, this division in the French nobility resulted in the war of the League and wars of religion. The massacre of the Protestants on the night of St. Bartholomew (1572) raised to such a pitch the pride of the House of Guise that Henry III. fled to the camp of the Bourbon leader, where he was murdered by a fanatical monk. The name of Charles IX. remains associated with the horrors of the St. Bartholomew's night, which witnesses the striking of a blow at the very heart of the nation.

The Bourbon Line.—The accession of the Bourbon prince, Henry IV. of Navarre (1589-1610), allayed the fury of religious wars, but his recantation of Protestantism in favor of Catholicism disappointed his own party, to which, however, he granted the free exercise of their religion by the edict of Nantes (1598).

Henry, however, meditated the humiliation of the house of Austria, and was on the eve of his departure for the army when he was assassinated by Ravaillac, May 14, 1610.

Under the regency of his widow, Maria de' Medici, mother of Louis XIII., the kingdom was distracted by war between the queen mother and the young king. Cardinal Richelieu, who took the reins of government in 1624, consolidated the power of the monarch at home, and, while annihilating the power of the French Protestants, energetically supported the German Protestants against the house of Austria.

His successor, Cardinal Mazarin, pursued the same policy; and the treaty of Westphalia (1648) asserted the triumph of religious and political liberty in Germany, and the victory of France, which added to her territory the province of Alsace.

The troubles of the Fronde, a faint image of the old civil wars, detracted nothing from the influence gained abroad by the French government, and Mazarin concluded with Spain, in 1659, the treaty of the Pyrenees, which secured two other provinces to France—Artois and Roussillon.

Age of Louis XIV.—Under the personal rule of Louis XIV. France rose to the height of glory, while he himself was placed above all control. From the day of Mazarin's death (1661) he assumed the direction of public affairs. In the first years of his administration the national wealth, promoted by the admirable efforts of Colbert, increased with unusual rapidity. Intellectual progress kept pace with material, and everything conspired to create a literary period of great magnificence.

The king's military successes, too, achieved through Condé, Turenne, Luxembourg, and others, were brilliant; and he added to his kingdom Flanders, Franche-Comté, the imperial city of Strasburg, and several other important territories.

But the revocation of the edict of Nantes in 1685 drove from the kingdom a large number of its best citizens, and crippled many branches of industry. The war of 1689-1697 against the league of Augsburg greatly exhausted the country, and that of the Spanish succession nearly reduced it to extremities; but after a contest of twelve years Louis succeeded, and by the treaties of Utrecht and Rastadt (1713 and 1714) the house of Bourbon, in the person of Louis's grandson, Philip V., inherited the best part of the Castilian monarchy.

Louis XIV. died in 1715, after an unparalleled reign of seventy-two years. The burden which he had borne was far too heavy for his weak successors; and toward the end of Louis XV.'s reign France could scarcely be ranked among the great European powers. The four wars in which she then participated, against Spain (1717-1719), during the regency of Philip of Orleans, for the succession of Poland (1733-1735), for the succession of Austria (1740-1748), and finally the seven years' war (1756-1763), were productive only of disgrace and disaster, including the loss of Canada.

Prelude to the Revolution.—Louis XV. died in 1774, and his grandson Louis XVI. ascended the throne at a period which was perhaps the most inglorious of French history. The kingdom was on the verge of financial as well as political ruin, and it seemed evident that a disastrous crisis was approaching.

An attempt to conciliate the people was made by the restoration of the parliament of Paris; but instead of promoting reform, this body proved a hindrance to it. Turgot and Malesherbes, associated with Maurepas in the ministry, acted with considerable efficiency in the endeavor to improve the state of affairs, but were deposed through the influence of the court party. Necker, who became minister of finance in 1777, at first seemed to improve matters slightly; but the opposition of the

nobles and clergy to any scheme of general taxation, with other causes, led to his deposition.

His successor, Calonne, recklessly plunged the finances into a more hopeless condition than ever, and in 1789 the king was induced to call together the States-General, the really popular assembly of representatives, which had not met since 1614, and then in vain. Thenceforward there was a succession of barriers thrown down; madness set in upon the long-oppressed people, who wreaked the vengeance of a thousand years. Frightful mobs rose upon all whom they connected with their past misery. Nobles and clergy fell; the king was dethroned, and in 1793 was executed. A reign of terror set in, during which Robespierre and other fanatics, who thought they must destroy in order to build up, sent to the beheading machine, the guillotine, thousands of victims, and hoped to have swept away even the Christian religion, together with all the old abuses of power.

The Advent of Napoleon and the Directory.—When they fell in 1794, less sanguinary counsels prevailed, and, after sundry attempts at forms of government, Napoleon Bonaparte, of Corsican birth, climbed to supreme power. His course had been through victories. Belgium had been overrun, the Austrians forced back across the Rhine, the allied armies of England and Holland gradually pushed back, and Prussia and Spain forced to conclude peace. The new government began on October 28, the convention having been dissolved on the 26th. England, Russia, and Austria, in a new coalition, now began to carry on a more vigorous warfare; but Carnot's strategic direction soon baffled it. Bonaparte was put in command of the army which was now to advance against the Austrians from Italy, and in 1796 and 1797 completely changed the condition of affairs. At the truce of Leoben (April 18, 1797) France controlled all Italy; Austria surrendered all rights in Belgium and recognized those republics which France established; and the history of France became almost wholly identified for nearly eighteen years with that of a single man, Napoleon Bonaparte.

The Consulate.—Bonaparte was chosen first consul for ten years, December 13, 1799; consul for life, August 2, 1802; then hereditary emperor, May 18, 1804. He reformed and reorganized legislation at home by the formation of the civil code, the organization of public instruction, and the improvements he introduced in all the branches of public service; while he added to his military and political glory by a new succession of triumphs, resulting in the treaties of peace signed at Presburg (1805), Tilsit (1807), and Vienna (1809).

He had now reached the height of his glory; he had placed his brothers on the thrones of Holland, Westphalia, and Spain, and his brother-in-law on that of Naples; but his power was shaken by the resistance which he met with in the Spanish peninsula (1808-1813); and his prestige was ruined by his expedition to Russia in 1812. The European nations united against him, and inflicted upon him at Leipsic, October 16-19, 1813, a blow from which he never recovered.

The Restoration.—Napoleon was dethroned in April, 1814, exiled to the island of Elba, and the brother of Louis XVI. received from the conquerors the sceptre of France, now restricted to her old limits. The sudden return of Napoleon from Elba, however, overthrew this new power; and for one hundred days, from March 20 to June 28, 1815, he was again the sovereign of France; but the battle of Waterloo (June 18, 1815) destroyed his power forever, and the Bourbons once more ruled the kingdom.

Louis XVIII. granted a charter to his subjects, and died in 1824 in undisturbed possession of his throne. His brother and successor, Charles X., sought popularity by supporting the Greek insurrection against Turkey and conquering Algiers; but having attempted to suspend some of the most important guarantees secured by the charter, a formidable insurrection broke out, July 27, 1830, and he was obliged to abdicate.

House of Orleans.—After a few days' interval the head of the younger branch of the house of Bourbon, Louis Philippe, duke of Orleans, was appointed "king of the French" (August 9) by the chamber of deputies. The choice, being acceptable to the middle classes or *bourgeoisie*, was maintained; and notwithstanding some occasional outbursts of republicanism among the people, the July monarchy, as it was called, lasted for nearly eighteen years.

Revolution of 1848.—A political manifestation in favor of parliamentary reform brought on another revolution, February 24, 1848, and France became a republic, with a provisional government in which Lamartine played the most conspicuous part; but within a few months the majority of the constituent assembly, frightened by socialistic movements and a terrible civil struggle in the capital (June 23-26), became hostile to the new form of government. On December 10, 1848, Louis Napoleon Bonaparte, nephew of Napoleon I., was elected president for a term of four years. On December 2, 1851, the president dissolved the assembly, assumed dictatorial powers, and appealed to the people to sanction his act by their votes. He was reëlected president for a term of ten years; a new constitution was promulgated; and finally, on November 7, 1852, the senate proposed the reëstablishment of the empire.

Second Empire.—The empire was proclaimed, December 2, 1852, and Louis Napoleon ascended the throne with the title of Napoleon III. The chief event of the early portion of this reign was the Crimean war, which largely increased the military prestige of the nation, as well as the popularity and strength of Napoleon's rule. The war with Austria (1859) left France in a position of even greater authority than before in European politics. In 1860 Savoy and Nice were ceded to France by Italy. The emperor's schemes for establishing the Hapsburg prince Maximilian on the throne of Mexico proved so ignominious a

failure as to do much toward undermining the opinion of his power that had been held in Europe.

The course which Napoleon pursued during the Prusso-Austrian war in 1866 did not tend to restore confidence in him. In 1867 he aided in defending the power of the pope against the Garibaldians. In 1868 the growth of public opinion against the emperor was conspicuous; in 1869 much excitement was caused by the exposure of the confusion in financial affairs; and in 1870 popular disturbances, fomented by Rochefort, broke out on the acquittal of Pierre Bonaparte for the shooting of Victor Noir.

The demand for reforms was answered by a new constitution, which was finally confirmed by a *plebiscite* on May 8.

Franco-Prussian War.—In the spring of 1870 there were unmistakable manifestations of a hostile spirit on the part of the government against Prussia. The declaration of the candidature of the Hohenzollern prince Leopold for the throne of Spain furnished an immediate cause of war. The voluntary withdrawal of Prince Leopold followed the remonstrances of France, but the latter demanded also of the king of Prussia an explicit promise that no prince of Hohenzollern should ever be a candidate for the Spanish crown. This demand was refused, and war was declared by France, July 19.

On the 28th Napoleon went to Metz, where he personally took command of his forces; and on August 2 the king of Prussia, accompanied by Bismarck and Moltke, joined his army. On the latter day the French bombarded and took Saarbruck. On August 4 the German advance, under the crown prince, defeated the French at Weissenburg, and on the 6th totally defeated MacMahon at Worth.

On the 11th the three German armies under Steinmetz, Prince Frederick Charles, and the crown prince effected a junction on French territory, with headquarters at Saarbruck. By the 14th Steinmetz had advanced to near Metz, where the French army was concentrated under Bazaine, and on the afternoon of the same day won a victory at Courcelles; on the 16th Frederick Charles won a second battle at Marsla-Tour; and on the 18th the combined forces under King William again defeated the French at Gravelotte.

Bazaine now drew within the fortifications, and the Germans, leaving a portion of their forces to invest the city, marched against MacMahon at Chalons. News reaching them of the advance of MacMahon to relieve Bazaine, they turned northward to intercept him. On the 30th they surprised a corps of General Failly near Beaumont, and fought a battle which resulted in the retreat of the French beyond the Meuse and their final withdrawal to Sedan.

The battle of Sedan was begun by the Germans September 1. After severe fighting they drove the French from all sides to that fortress, where, almost surrounded and without provisions or defenses, they were compelled to capitulate. The emperor surrendered to King William in person, September 2, and was carried a prisoner to Wilhelmshohe. In dead, wounded, and prisoners, the French thus lost in the last few days an army of nearly one hundred and fifty thousand men.

The Third Republic.—The news of Sedan created intense excitement at Paris, and the popular indignation against Napoleon and his party was without bounds. Gambetta proclaimed the republic; and a provisional government of national defense was at once formed, with General Trochu for president and Jules Favre for vice-president. The empress took refuge in England.

The German army entered Rheims on the 5th, and on the 15th they had closely approached Paris. A sortie by General Ducrot on the 19th was repulsed, and a few days later the actual investment of the city was begun. The German headquarters were established at Versailles. A portion of the French government of national defense remained in the capital; another portion, in order to be in communication with the provinces, was established at Tours. Toul surrendered on the 23rd. Strasburg capitulated in the night of September 27-28. Soissons and Schlettstadt capitulated respectively on October 16 and 24, and on the 27th Metz also yielded, Bazaine surrendering one hundred and seventy-three thousand men.

In the meantime the situation of Paris had become hopeless; and on January 28 arrangements for its capitulation had been concluded and provision made for a general armistice. On February 17, 1871, Thiers was chosen chief executive of the republic. On the 26th the preliminary treaty of peace was signed at Versailles, by which France ceded to Germany the greater part of Alsace and Lorraine, and agreed to pay as war indemnity five milliards of francs. The definitive treaty with Germany had been signed at Frankfort on the 10th of May.

In 1873 the Thiers administration was overthrown and replaced by one under Marshal MacMahon. In 1875 a Parliamentary Republic was established, and still remains under the guarantees of the constitution. In 1877 MacMahon was succeeded by Grevy. By this time the republic was fairly firmly established and withstood many attacks. A policy of colonial expansion was adopted, particularly in Egypt, but in spite of the dual control France and England established in 1879, France, in 1882, refused to help England in Egypt, and lost any control she had there.

The Triple Alliance of 1883 isolated France, but in 1890 she confronted the Triple Alliance with the Dual Alliance—between France and Russia—and made great attempts to establish colonial power.

The outstanding events of 1914–1919 and since were those connected with France's participation in the European war as the leading military power of the Entente Allies.

By the provisions of the Peace Treaty, France regained possession of Alsace-Lorraine with 5,604 square miles, and a prewar population of 1,874,014 re-establishing thereby the frontier as it was before the Franco-Prussian War of 1870-'71 and increasing its European area to 212,658 square miles. This territory passes to France free of all public debts.

The Peace Treaty also gives France a free hand in northern Africa. Germany renounces all rights conferred on her by the general act of Algeciras of April 7, 1906, and by the Franco-German agreements of February 9, 1909 and November 4, 1911. (See further under European War).

The area and population of the colonial domain of France at the beginning of the European war was as follows:

Colonies and Year of Acquisition	Area in Sq. Mi.	Population
In Asia:		
India (1679)	196	277,000
Annam (1884)		
Cambodia (1862)		
Cochin-China (1861)	309.980	16,317,000
Tonking (1884)		
Laos (1892)		
Total Asia	310,176	16,594,000
In Africa:		
Algeria (1830-1902)	343,500	5,231,850
Sahara (——)	1,544,000	800,000
Tunis (1881)	45,779	1,500,000
Senegal (1637-1880)		915,000
Upper Senegal & Niger (1893)		4,415,000
Guinea (1843)	1,585,810	1,498,000
Ivory Coast (1843)		890,000
Dahomey (1893)		749,000
Mauritania (1893)		400,000
Congo (1884)	669,280	5,000,000
Reunion (1649)	970	201,000
Madagascar (1643-1896)	226,015	2,701,000
Mayotte (1843)	840	96,000
Somali Coast (1864)	5,790	180,000
Total Africa	4,421,934	24,576,850
In America:		
St. Pierre and Miquelon (1635)	96	6,000
Guadeloupe (1634)	688	182,000
Martinique (1635)	378	182,000
Guiana (1626)	34,060	27,000
Total America	35,222	397,000
In Oceania:		
New Caledonia (1854-1887)	7,200	55,800
Tahiti, etc. (1841-1881)	1,544	30,000
Total Oceania	8,744	85,000
Grand Total	4,776,126	41,653,650

SOVEREIGNS AND PRESIDENTS OF FRANCE

Giving, in order, the Royal Houses to which the French sovereigns belonged; Period of Rule in Chronological order; names of kings, emperors, regents and presidents; dates of birth and death of each; their genealogy or lineage; and other important personal facts.

THE MEROVINGIANS

420-428.—Pharamond (?-?); life obscure.

428-448.—Clodion (?-?); son of Pharamond; king of the Salic Franks.

448-457.—Merovaeus (411?-457); founder of the Merovingian Dynasty.

458-481.—Childeric (?-481); son of Merovaeus, king of the Franks.

481-511.—Clovis I. (465-511); son of Childeric; real founder of the Frankish monarchy. At his death his four sons divided the empire.
Childebert; Paris.
Clodomir; Orleans.
Thierry; Metz; and
Clotaire; Soissons.

558-561.—Clotaire I.; sole ruler (497-561); fourth son of Clovis. Upon his death the kingdom was divided between four sons: viz.
Charibert, ruled at Paris.
Gontram, in Orleans and Burgundy.
Sigebert, at Metz and Chilperic, at Soissons; both assassinated by Fredegonde.

575-596.—Childebert II. (570-596); son of Sigebert and Princess Brunehaut; ruled under the regency of his mother; poisoned.

613-628.—Clotaire II. (584-628); son of Chilperic I.

628-638.—Dagobert I., the Great (602-638); son of Clotaire II.; divided the kingdom between his two sons:
Clovis II., Burgundy and Neustria.
Sigebert II., Austrasia.

670-673.—Childeric II. (649-673); son of Clovis II.; assassinated, with his queen and his son Dagobert, in the forest of Livri.

687-714.—Pepin II., of Heristal (?-714); ruled the whole kingdom of the Franks during the reigns of Dagobert II., Clovis III., Childebert III., and Dagobert III.

715-720.—Chilperic II. (?-720); deposed by Charles Martel, mayor of the palace in 717, restored in 720, but soon dies at Noyon.

720-737.—Thierry IV. (712-737); son of Dagobert III.; reigned under the influence of Charles Martel who took the title "duke of the Franks."

737-741.—Interregnum, till death of Charles Martel, 741.

742-752.—Childeric III. (?-755); son of Childeric II.; last of the Merovingians; made king by Pepin, 742; deposed by him, 752.

THE CARLOVINGIANS

751-768.—Pepin the Little (714-768); son of Charles Martel.

768-814.—Charlemagne, or Charles the Great (742-814); son of Pepin the Short; Charles crowned Emperor of the West, by Leo III., 800. Carloman reigned with him three years.

814-840.—Louis I., *le Debonnaire* (778-840); son of Charles the Great; emperor; dethroned, but restored.

843-877.—Charles the Bald (823-877); younger son of Louis le Debonnaire, king; emperor in 875; poisoned by Zedechias, a Jewish physician.

877-879.—Louis II. (846-879); son of Charles the Bald.

879-884.—Louis III. (863-882) and Carloman (?-?); sons of Louis II.; the former died 882, and Carloman reigned two years alone.

884-888.—Charles the Fat (839-888); son of Louis the German; usurps right of Charles the Simple.

888-898.—Count Eudes (?-898); Eudes, or Hugh, count of Paris.

898-922.—Charles the Simple (879-929); son of Louis the Stammerer; Charles III. (or IV.) was deposed, and died in prison in 929; he married Edgiva, daughter of Edward the Elder, of England, by whom he had a son, King Louis IV.

922-936.—Raoul (Rudolph of Burgundy) (?-?); Rudolph, or Raoul, duke of Burgundy; elected king, but never acknowledged by the southern provinces.

936-954.—Louis IV. (921-954); son of Charles the Simple; taken by his mother into England, died by fall from his horse.

954-986.—Lothaire (941-986); son of Louis IV.; ruled with his father from 952, succeeds him at fifteen years of age, protected by Hugh the Great; poisoned.

986-987.—Louis V. (966-987); son of Lothaire; poisoned (supposed by his queen, Blanche); last of race of Charlemagne.

HOUSE OF CAPET

987-996.—Hugh Capet, the Great (?-996); eldest son of Hugh the Abbot; usurps the rights of Charles of Lorraine, uncle of Louis IV. From him this race of kings is called Capetians.

996-1031.—Robert II. (971-1031); son of Hugh Capet; surnamed the Sage; died lamented.

1031-1060.—Henry I. (1011?-1060); son of Robert II.

1060-1108.—Philip I., the Fair (1052-1108); son of Henry I.; succeeded at eight years of age; ruled at fourteen.
1108-1137.—Louis VI. (le Gros) (1078-1137); son of Philip I.
1137-1180.—Louis VII. (1120-1180); son of Louis VI.; surnamed the Young; reigned with his father for some years.
1180-1223.—Philip II., Augustus (1165-1223); son of Louis VII.; succeeds at fifteen; crowned at Rheims in his father's lifetime.
1223-1226.—Louis VIII. (1187-1226); son of Philip Augustus.
1226-1270.—Louis IX., or St. Louis (1215-1270); son of Louis VIII; succeeded at fifteen, under his mother as guardian and regent; died in camp before Tunis.
1270-1285.—Philip III., the Bold (1245-1285); son of Louis IX.
1285-1314.—Philip IV., the Fair (1268-1314); son of Philip III.; king in his seventeenth year.
1314-1316.—Louis X. (1239-1316); son of Philip IV.; surnamed *Hutin*, an old word for headstrong, or mutinous.
1316-1321.—Philip the Hardy (1294-1322) second son of Philip IV.
1322-1328.—Charles IV., the Fair (1294-1328); youngest son of Philip the Fair.

HOUSE OF VALOIS

1328-1350.—Philip VI., of Valois (1293-1350); son of Charles of Valois.
1350-1364.—John II., the Good (1319-1364); son of Philip VI.; died suddenly in the Savoy in London.
1364-1380.—Charles V., the Wise (1337-1380); son of John II.
1380-1422.—Charles VI. (1368-1422); son of Charles V.
1422-1461.—Charles the Victorious (1403-1461); son of Charles VI.
1461-1483.—Louis XI. (1423-1483); son of Charles VII.; able but cruel.
1483-1498.—Charles VIII. (1470-1498); son of Louis XI.; the Father of his People; great-grandson of Charles V.
1498-1515.—Louis XII. (1462-1515); a descendant of the younger son of Charles V.
1515-1547.—Francis I. (1494-1547); son of Charles, Count of Angoulême; called the Father of Letters; great-great-grandson of Charles V.
1547-1559.—Henry II. (1519-1559); son of Francis I.; died of accidental wound by comte de Montmorency at the tournament for nuptials of his sister with the duke of Savoy.
1559-1560.—Francis II. (1543-1560); eldest son of Henry II.; married Mary Stuart, Queen of Scots.
1560-1574.—Charles IX. (1550-1574); second son of Henry II.; Catherine de' Medici, his mother, regent.
1574-1589.—Henry III. (1551-1589); third son of Henry II.; elected king of Poland; last of the house of Valois; stabbed by Jacques Clement, a Dominican friar.

HOUSE OF BOURBON

1589-1610.—Henry IV., the Great (1553-1610); son of Antoine de Bourbon, King of Navarre; son-in-law of Henry II.; assassinated by Francis Ravaillac.
1610-1643.—Louis XIII., the Just (1601-1643); son of Henry IV.
1643-1715.—Louis XIV., the Great (1638-1715); son of Louis XIII. and Anne of Austria.
1715-1774.—Louis XV. (1710-1774); great-grandson of Louis XIV.
1774-1793.—Louis XVI. (1754-1793); grandson of Louis XV.; ascended the throne in his twentieth year; married the archduchess Marie Antoinette, of Austria, May, 1770; dethroned, July, 1789; guillotined, January, 1793, and his queen, October following.
.....—Louis XVII., son of Louis XVI., never reigned; and died in prison, supposed by poison, June, 1795, aged ten years two months.

THE FIRST REPUBLIC

1792-1795.—National convention; first sat September 21, 1792; it consisted of seven hundred and fifty members.
1795-1799.—Directory nominated. November 1, 1795; the Directory (Lareveillère Lepaux, Letourneur, Rewbell, Barras, and Carnot) nominated November; abolished, and Bonaparte, Ducos, and Siéyès appointed an executive commission, November, 1799.

THE CONSULATE

1799-1804.—Napoleon Bonaparte (1769-1821); Cambacérès (1753-1824); and Lebrun (1739-1824), appointed consuls, December, 1799. Napoleon appointed consul for ten years, May, 1802; for life, August, 1802.

THE EMPIRE

(Established by the Senate, May 18, 1804.)

1804-1814.—Napoleon (Bonaparte) I. (1769-1821), decreed Emperor, May 18, 1804. He renounced the thrones of France and Italy, and accepted the Isle of Elba for his retreat, April 5, 1814. Again appeared in France, March 1, 1815. Was defeated at Waterloo, June 18, 1815. Abdicated in favor of his infant son, June 22, 1815. Banished to St. Helena, where he died, May 5, 1821.
.....—Napoleon II. (1811-1832); never reigned; he was Napoleon's son by his second wife, Maria Louisa of Austria, and later created Duke of Reichstadt, and King of Rome.

RESTORATION OF THE BOURBONS

1814-1824.—Louis XVIII. (1755-1824); brother of Louis XVI.; married Marie-Josephine-Louise of Savoy; entered Paris, and took possession of the throne, May, 1814; obliged to flee, March, 1815; returned July, same year; died without issue.
1824-1830.—Charles X. (1757-1836); younger brother of Louis XVIII.; married Marie-Thérèse of Savoy; deposed July, 1830. He resided in Great Britain till 1832, and died at Gratz, in Hungary.

HOUSE OF ORLEANS

1830-1848.—Louis Philippe (1773-1850); son of Louis-Philippe, duke of Orleans, called *Egalité*, descended from Philippe, duke of Orleans, son of Louis XIII.; married, 1809, Maria-Amelia, daughter of Ferdinand I., king of the Two Sicilies; raised to the throne as king of the French, 1830; abdicated, 1848; died in exile, in England.

THE SECOND REPUBLIC, 1848

February 22 to December 19, 1848.—The revolution commenced in a popular insurrection at Paris, February, 1848. The royal family escaped by flight to England; a provisional government was established, monarchy abolished, and France declared a republic.
1848-1852.—Charles Louis Napoleon (1808-1873); declared by the National Assembly President of the Republic of France; and proclaimed next day, December 20, 1848; elected for ten years, December, 1851.

THE SECOND EMPIRE

1852-1870.—Napoleon III. (1808-1873); nephew of Napoleon I.; formerly president of the French Republic as Charles Louis Napoleon; elected Emperor, November, 1852; proclaimed, December, 1852; surrendered himself a prisoner to the King of Prussia at Sedan, September, 1870; deposed at Paris, September 4; died at Chislehurst, England, and buried there.

THE THIRD REPUBLIC

1870-1871.—Committee of Public Defense.
1871-1873.—I. Louis Adolphe Thiers (1797-1877); appointed President of the French Republic by the National Assembly, 1871; resigned, 1873.
1873-1879.—II. Marshal M. E. Patrice Maurice MacMahon (1808-1893); elected president, 1873.
1879-1887.—III. François Paul Jules Grévy (1807-1891); elected president, January, 1879; re-elected, 1885; resigned, December, 1887.

1887-1894.—IV. Marie-François Sadi-Carnot (1837–1894); elected president, December, 1887; assassinated, June, 1894.
1894-1895.—V. Jean Pierre Paul Casimir-Périer (1847–1907); elected president, June, 1894; resigned, January, 1895; succeeded by:
1895-1899.—VI. François Félix Faure (1841–1899); elected president, January, 1895; died, February, 1899.
1899-1906.—VII. Émile François Loubet (1838——); elected president, February, 1899.
1906-1913.—VIII. Armond Fallières (1841——); elected president, 1906.
1913-1920.—IX. Raymond Poincaré (1860——); elected president, 1913.
1920.—— X. Paul E. L. Deschanel (1856–1922); elected president, January, 1920; resigned, Sept. 16, 1920; succeeded by:
1920-1927.—XI. Alexander Millerand (1859——); elected president, Sept. 23, 1920.

GERMANY

GERMANY (from Lat. Germania) is the English name of the country which the natives call Deutschland, and the French L'Allemagne; as a result of the European War of 1914–1918, the imperial government was overthrown and Germany became a federated republic.

The German Republic is composed of a federation of twenty-five states and free cities, self-governed. Heligoland was ceded by Britain to Germany in 1890, and Alsace-Lorraine was returned to France, 1919, by the Treaty of Versailles.

Divisions of the Republic.—The political divisions or states of the German Republic, together with their areas and population at the last census, are given in the subjoined table:

States	Area in Sq. Miles	Population at Last Census
Former Kingdoms		
1. Prussia	134,616	40,163,333
2. Bavaria	29,292	6,876,497
3. Saxony	5,789	4,802,485
4. Wurttemberg	7,534	2,435,611
Former Grand-Duchies		
5. Baden	5,823	2,141,832
6. Hesse	2,966	1,282,219
7. Mecklenburg-Schwerin	5,068	639,879
8. Saxe-Weimar	1,397	417,166
9. Mecklenburg-Strelitz	1,131	106,347
10. Oldenburg	2,482	482,430
Former Duchies		
11. Brunswick	1,418	494,387
12. Saxe-Meiningen	953	278,792
13. Saxe-Altenburg	511	21 ,313
14. Saxe-Coburg-Gotha	764	25 ,208
15. Anhalt	888	331,047
Former Principalities		
16. Schwarzburg-Sondershausen	333	89,984
17. Schwarzburg-Rudolstadt	363	100,712
18. Waldeck-Pyrmont	433	61,723
19. Reuss, Junior Branch	122	152,765
20. Reuss, Elder Branch	319	72,616
21. Schaumburg-Lippe	131	46,650
22. Lippe-Detmold	469	150,749
Former Free-Towns		
23. Lubeck	115	116,533
24. Bremen	99	298,736
25. Hamburg	160	1,015,707

Note. See subsequent tables for territorial losses in Europe and corresponding losses in population.

Location and Extent.—This combination of Germanic States extends now from the Alps and the Bohemian mountains on the south to the Baltic on the north; and from the borders of France, Belgium, and Holland, on the west, to those of Russia on the east; the greatest distance across it from east to west and from north to south being about five hundred miles. The coast-line measures about nine hundred and fifty miles. The most remarkable features of the coast are the expansions of the river mouths in the Baltic; the lagoons called the Kurische Haff, Frische Haff, and Stettiner Haff; the estuaries of the Elbe and Weser; and the rounded inlets of Jade Bay and the Ems mouth, on the North Sea.

The mountains on the south and the sea on the north give natural frontiers for the most part, but west and east artificial boundaries are marked out, which correspond only in a few parts with the ethnographic limits of Germanic and Romanic peoples on the one side, and Germanic and Slavonic on the other.

Surface Characteristics.—The surface of the empire falls naturally into three divisions: the lowlands in the north, the table-land of the south, and the basin of the Middle Rhine.

The Lowlands are part of the Great European plain, and are largely occupied with sandy tracts, with here and there deposits of peat. They are well watered, and in certain districts fertile, while the monotony of their level is broken by two lines of hills whose heights vary from five hundred to eight hundred feet, and which may be said to extend roughly from the Mecklenberg to the Vistula, and from the moors of Lüneburg in Hanover to Silesia.

Table-lands.—In the southern plateau of Bavaria, the Fichtelgebirge is clearly the pivot round which the other mountain systems revolve. Thus, to its northwest there rises the Thuringian Forest and the Harz Mountains, and to the northeast the Erzgebirge, the Riesengebirge, and the Sudetic Mountains. Southwest radiate the Franconian and Swabian Juras and the Schwarzwald or Black Forest heights. Westward stretch the Taunus Mountains, while beyond these, and divided only by the Rhine, are the ridges of the Vosges. In the extreme southeast of Bavaria the Tyrolese or Noric Alps follow the northern bank of the Inn, and from this range rises the Zugspitze (nine thousand seven hundred feet), which is the highest summit in the whole empire. Between Basle and Mannheim, the Middle Rhine is splendidly sheltered by the Vosges and the Black Forest, which guard its course to left and right. (See further under the Rhine.)

Rivers.—By far the greater part of the country is drained northwards to the Baltic and the North Sea by its navigable highways, the Vistula, Oder, Elbe, Weser, and Rhine. The southeastern corner alone belongs to the upper basin of the Danube, flowing towards the Black Sea. (See Danube.)

The Vistula and the Oder are Baltic waterways, but more important from a commercial point of view are the Elbe, with its chief

affluents the Mulde, Havel, and the Saale, and the great Rhine, which both empty into the North Sea, along with the smaller Ems and the Weser, which latter is the only purely German stream. This fact is worth noticing, as the sources of the Oder, Elbe, and Vistula must be traced in Austria, and sections only of the Rhine and Danube traverse the empire.

Climate.—Broadly speaking, the general contours are not favorable to climate; for the level exposed flats, north and east offer no resistance to the passage in winter of the dry, piercing winds from Siberia and the Arctic, while to the south and west the mountainous tracts form effectual barriers against the moist Anti-trades. Extremes of temperature increase eastward in proportion to the distance from the Atlantic. In the warmer latitudes of the south, the elevations counteract the natural tendency to grow hotter, so that Ratisbon has the same temperature as Hamburg. In the Upper Harz the rainfall reaches sixty-six inches, but the mean annual precipitation is only about twenty inches. On the whole the climate may briefly be described as continental. It should be noted that the general slope of the country is from the southeast to northwest, that is, away from the sun, and also that the Rhine valley is so delightfully sheltered that it reaps the full benefit of its warm latitude, and thus enjoys excellent weather conditions.

Internal Communications.—The commercial prosperity of Germany may in some measure be traced to the excellence of the railways, the majority of which are managed by the state. Berlin is splendidly provided with communications by rail, and it may with truth be said that it is within twenty-four hours' reach of almost every point in the empire. Further, the trunk systems have many of them an international importance; for the great Oriental express from Paris to Constantinople traverses the line from Strassburg to Vienna through Munich, while Paris is linked with the remote Siberia by means of the lines from Cologne to Berlin and from Berlin to Warsaw. Berlin is also directly connected with Breslau, Hamburg, Danzig, and Königsberg. From Frankfort-on-Main, which is the trading center between north and south Germany, lines radiate to Cologne, Ostend, Antwerp, Flushing, Rotterdam, and Berlin northward, and in a southerly direction to Strassburg, Basle, Munich, and Vienna, while east and west it is joined up with Dresden, Breslau and Metz.

Domestic commerce has been further facilitated by an elaborate network of canals. By far the most important of these is the Kaiser-Wilhelm Canal (sixty-one miles long), which unites the North Sea and the Baltic. The Dortmund-Ems (one hundred and fifty miles long) and the Elbe-Trave (forty-three miles long) have only recently been completed. Since the building of the Rhine and Rhone canal through Mulhaüsen, it has been possible for a barge to pass from Rotterdam to Marseilles without unloading.

The union of the Danube and Rhine is effected by the Ludwigs canal, and that of the Seine and Rhine by the Rhine and Marne Canal. A number of canals, including the Teltow (opened in 1906), serve to connect the Spree, and therefore Berlin, with the Oder and the Elbe, the Oder and Vistula being joined by what is known as the Bromberger Canal.

Productions and Industries.—Following this distribution of climate, the forests which still cover a great part of Germany, and form a feature of its landscapes, are chiefly of the hardier pines in the north and east, and of deciduous trees in the south and west. About sixty-one per cent of the surface of the empire is suitable for cultivation, the forests occupy twenty-five per cent, and the uncultivable moors and mountain tracts only eight per cent.

Agriculture.—There are sixty-five million acres of cultivated soil, and over twenty-one million acres of grass and pasture lands. Rye and oats are the chief grains, the former flourishing in the north despite the drawbacks of poor climate and soil. Almost as much land is devoted to potatoes as to rye; for the sandy plains of western Prussia and Pomerania seem to suit this crop equally well. Flax, hemp, and the beet—the last for the sugar industry—are grown in Saxony and in the Baltic provinces, especially in Hanover. The vine covers the dry, sunny slopes of the Vosges, and is also extensively grown along the Rhine. The rich alluvial soils of the sheltered valleys in the southwest are also favorable to the production of tobacco and hops, which are accordingly cultivated with success in Baden, Hesse, and Bavaria.

Minerals.—Germany is rich in minerals, especially in coal and iron. The great industrial activity of the country very largely depends on the fact that these two minerals are found together, and moreover in proximity to navigable water-courses. In the Rhine basin the coal beds follow the courses of the Ruhr, Saar, and Ill, and excellent iron ore is found in both the Ruhr and Saar coal fields. Coal is also found in Silesia, while the Saxon mines in the Elbe basin yield chiefly the lignite variety.

Almost one half of the zinc produced in the world is mined in Germany, the chief centers being at Aachen (Aix-la-Chapelle), in Rhenish Prussia, and Königshütte, on the Oder coal fields, while nearly half the silver of Europe is produced from the silver, lead, and copper ores found in the Harz Mountains, Silesia, and the mines of Freiberg (Saxony). Most of the German copper comes from the Harz and Erzgebirge Mountains. Large quantities of rock and potassium salts are produced in Hanover, Saxony, Thuringia, and Anhalt. The mineral springs of Baden-Baden, Wiesbaden, Ems, etc., are world famous.

Manufactures.—The industrial development of Germany proceeded at an almost unprecedented rate throughout the last century. The following catalogue will give some idea of the local distribution of the various industries: Iron goods and machinery are manufactured in the states of Prussia, Saxony, and Bavaria; steel goods in Rhenish Prussia. Woolens and worsteds are produced in Saxony and the Rhine province; cotton

goods in the states of Prussia, Saxony, Baden, and Bavaria; silk at Elberfeld (Rhenish Prussia) and in Baden; and linen goods in Westphalia, Silesia, and Saxony. The Rhine and Moselle districts are important centers for light wines; Bavaria is famous for its toys, like Nuremberg for its watches and pencils, and Meissen, Dresden, and Berlin, etc., for their porcelain. Finally there are manufactories up and down the country of chemicals, beer, sugar, tobacco, leather (in Hesse-Darmstadt), and paper.

People and Language.—The German-speaking inhabitants of the empire are about ninety-seven per cent of the total population; but a considerable proportion of these are not of the Germanic stock. Many Poles, Lithuanians, French and Czechs were re-united to their respective nationalities in 1919. Among the peoples retaining their own language are the Wends (in Silesia, Brandenburg, and Saxony), Czechs (in Silesia), some Lithuanians (in eastern Prussia), Danes (in Sleswick), French (in Rhenish Prussia), and Walloons (about Aix-la-Chapelle in Rhenish Prussia). The Germans are divided into High and Low Germans; the language of the former is the cultivated language of all the German states; that of the latter, known as Platt-Deutsch, is spoken in the north and northwest. (See further, Teutonic peoples, in Book of Races.)

Education and General Culture.—Germany stands conspicuously foremost in the filed of state education, and so far is without rival for the admirable systemization and for the variety and thoroughness of the technical trainings provided. It is established by law that every child from the age of six to fourteen must attend one of the elementary schools ("Volkschulen"), or some other recognized scholastic institution.

There are also a number of fully-equipped Technical High Schools, with the power of granting degrees, and some one thousand four hundred secondary schools (gymnasia, realschulen, oberrealschulen, etc.); numerous special schools of technology, agriculture, forestry, mining, commerce, military science, etc. There are twenty universities in Germany, located, respectively, at Königsberg, Berlin, Breslau, Greifswald (in Pomerania, southeast of Stralsund), Kiel, Halle, Göttingen, Münster, Bonn, Marburg, Rostock, Giessen, Jena, Leipzig, Heidelberg, Freiburg, Tübingen, Munich, Erlangen, and Wurzburg. All of these have the four faculties of theology, law, medicine, and philosophy, and many are some of the oldest foundations of their kind in Europe.

Outside the country the best known are probably Berlin, Munich, Leipzig, and Bonn, which also have the largest numbers of undergraduates, followed by Göttingen, Heidelberg, and Jena. Four teach theology according to the Roman Catholic doctrine, while in four others the theological faculty is open to both Protestants and Roman Catholics; the remaining universities are Protestant.

Culture is further stimulated in the large towns by public libraries, learned societies, museums, art galleries, and observatories, whereas musical knowledge and the drama diffuses itself from the highly-reputed conservatories at Leipzig, Dresden, Munich, Frankfort, and Berlin.

Religion.—The Constitution provides for entire liberty of conscience and for complete social equality among all religious confessions. The relation between Church and State varies in different parts of the empire. The Jesuit order is interdicted in all parts of Germany, and all convents and religious orders have been suppressed.

Protestantism predominates in the north and middle, and Roman Catholicism in the southeast and west, although very few states exhibit exclusively either form of faith. The Protestants belong chiefly either to the Lutheran confession, which prevails in Saxony, Thuringia, Hanover, and Bavaria east of the Rhine, or to the Reformed or Calvinistic Church, which prevails in Hesse, Anhalt, and the Palatinate. A union between these two churches has taken place in Prussia. There are five Roman Catholic archbishoprics and fourteen Roman Catholic suffragan bishoprics and six bishoprics immediately subject to Rome.

Defense.—Military service in Germany was formerly compulsory and universal, with the usual exemptions. It is now considerably modified.

Army. — By the regulations in force, every German capable of bearing arms served in the standing army for seven years (generally his twentieth to his twenty-seventh year). Two years were spent in active service and the remainder in the army of reserve. He then spent five years in the first class of the Landwehr, after which he belonged to the second class till his thirty-ninth year. Besides this, every German from seventeen to twenty-one and from thirty-nine to forty-five was a member of the Landsturm, a force only to be called out in the last necessity. Those who passed certain examinations were required to serve only one year with the colors.

The wide stretches of unprotected borderlands obliged the Germans to consider very carefully the question of frontier defenses. Thus the recent empire was divided into ten "fortress districts," in which the following were the chief fortified cities: Danzig, Königsberg, Posen, Neisse, Spandau, Magdeburg, Küstrin, Mainz, Ulm, Metz, Cologne, Koblenz, Kiel, and Strassburg.

Navy.—Rapid progress characterized in recent years the formation of a German navy. Prussia took the initiative in gathering together a fleet, but by 1851 it had grown only to fifty-one vessels, thirty-six of which were small gunboats. However, an advance was made in 1867, when every vessel in the navy flew the national colors (black, white, and red), and during the last twenty-five years the measure of progress was phenomenal.

Kiel is the chief naval station on the Baltic, and Wilhelmshaven on the North Sea, these two bases being connected by the Kaiser Wilhelm Canal across the Schleswig-Holstein peninsula. Other naval establishments are Danzig, Cuxhaven, and Sonderburg.

Museum of Fine Arts Cathedral

PANORAMIC VIEW OF THE HEART OF BERLIN, SHOWING THE MUSEUM OF ART,

Chief Cities.—German cities and towns are officially distinguished as large cities (with one hundred thousand inhabitants and upwards); medium cities (twenty thousand to one hundred thousand inhabitants); small cities (five thousand to twenty thousand inhabitants); and country towns (two thousand to five thousand inhabitants). According to the latest census, the population of cities over fifty thousand was a follows:

Cities	State	Latest Population
Berlin	Prussia	2,070,695
Hamburg	Hamburg	932,166
Munich	Bavaria	595,053
Leipzig	Saxony	587,635
Dresden	Saxony, K.	546,882
Cologne	Prussia	516,167
Breslau	Prussia	511,891
Frankfort-on-Main	Prussia	414,598
Dusseldorf	Prussia	357,702
Nürnberg	Bavaria	332,651
Charlottenburg	Prussia	305,181
Hanover	Prussia	302,384
Essen	Prussia	294,629
Chemnitz	Saxony, K.	287,340
Stuttgart	Württemberg	285,589
Magdeburg	Prussia	279,685
Bremen	Bremen	246,827
Königsberg	Prussia	245,853
Rixdorf	Prussia	237,378
Stettin	Prussia	236,145
Duisburg	Prussia	229,478
Dortmund	Prussia	214,333
Kiel	Prussia	211,044
Mannheim	Baden	193,379
Halle-on-Saale	Prussia	180,551
Schoeneberg	Prussia	172,902
Altona	Prussia	172,533
Danzig	Prussia	170,347
Elberfeld	Prussia	170,118
Gelsenkirchen	Prussia	169,530
Barmen	Prussia	169,201
Posen	Prussia	156,696
Aachen	Prussia	156,044
Cassel	Prussia	153,078
Brunswick	Brunswick	143,534
Bochum	Prussia	136,916
Karlsruhe	Baden	134,161
Crefeld	Saxony, K.	129,412
Plauen	Prussia	121,104
Mülheim-on-Ruhr	Prussia	112,602
Erfurt	Prussia	111,461
Mainz	Hesse	110,634
Wiesbaden	Prussia	109,033
Augsburg	Bavaria	102,293
Lübeck	Lübeck	98,620
Münster	Prussia	90,283
Oberhausen	Prussia	89,897
Hagen	Prussia	88,625
Bonn	Prussia	87,967
Darmstadt	Hesse	87,085
Görlitz	Prussia	85,790
Spandau	Prussia	84,919
Würzburg	Bavaria	84,387
Freiburg	Baden	83,328
Ludwigshafen-on-Rhine	Bavaria	83,297
Bielefeld	Prussia	78,334
Offenbach	Hesse	75,593
Linden	Prussia	73,352
Zwickau	Saxony, K.	73,538

Royal Palace National Monument

LUSTGARTEN, NEW CATHEDRAL, ROYAL PALACE, AND NATIONAL MONUMENT

Cities	State	Latest Population
Königshütte	Prussia	72,642
Remscheid	Prussia	72,176
Pforzheim	Baden	69,084
Frankfort on O	Prussia	68,230
Beuthen	Prussia	67,718
Harburg	Prussia	67,024
Gleiwitz	Prussia	66,983
Liegnitz	Prussia	66,620
Fürth	Bavaria	66,535
München Gladbach	Prussia	66,410
Osnabrück	Prussia	65,956
Rostock	Meckl.-Sch.	65,377
Potsdam	Prussia	62,224
Flensburg	Prussia	60,931
Elbing	Prussia	58,631
Bromberg	Prussia	57,585
Dessau	Anhalt	56,606
Koblenz	Prussia	56,478
Ulm	Württemberg	55,817
Kaiserslautern	Bavaria	53,803
Brandenburg-on-Havel	Prussia	53,595
Mülheim-on-Rhein	Prussia	53,428

CITIES OF PRUSSIA

Berlin, capital both of the Republic and of the State of Prussia, is by far the most important center of population in Germany. It lies on both sides of the Spree, and by the Spandau and Tetlow canals to the Havel it is linked with the systems of the Oder and the Elbe. It is eighty-four miles from Stettin and one hundred and eighty miles from Hamburg, and is the center of the great Prussian state railway system. (See Internal Communications.)

The city itself is served by an Outer Circle (*Ringbahn*) and by the *Stadtbahn,* running east and west through the city. There are electric surface lines, an overhead, or elevated, electric railway, and a shallow underground railway.

On an island in the center of the city stands the Royal Palace, a foursquare pile built at different times between 1451 and the present day. It stands in the Schloss-platz, and is one of the few old buildings in Berlin, dating from the sixteenth century. It contains over six hundred rooms, including the great White Salon, and halls of the Black and Red Eagle orders.

Unter den Linden.—From this island stretches westward the noblest street in Berlin, Unter den Linden ("under the lime trees"). The triumphal arch at the west end of the street, the Brandenburg Gate (a copy, made in 1789-93, of the Propylæa at Athens), forms the entrance to the large park (six hundred and thirty acres) of the Thiergarten. In the east is the magnificent avenue of the Siegesallee or Avenue of Victory, adorned with thirty-two marble groups of the rulers of Prussia and Brandenburg. In the Unter den Linden are many splendid public edifices, among which are the Armory, the Opera House, the Royal Library, the new Town Hall, the University, the palaces of William I. and of Frederick III., and the monument to Frederick the Great by Rauch.

In the northeast of the Thiergarten stands the most imposing building of the city, the Imperial Diet or Parliament, erected from designs by Wallot, in 1884-94, at a cost of over five million dollars.

Business Quarter.—The Friedrichs-Stadt is the business center of Berlin, and the streets in this section are interesting. The banking street, Behrenstrasse, and the Wilhelmstrasse, the official quarter, where is the imperial chancellor's palace, lie to the south. Fine shops and restaurants line the Friedrichstrasse, while Viktoriastrasse is one of the many thoroughfares of the fashionable district, southwest. Königstrasse and Kaiser Wil-

helmstrasse are the business streets of the city proper.

The Tempelhofn Feld, also to the south, is the parade and review ground of the Berlin garrison.

The most striking bridge is the Schloss-brücke, or Palace bridge, by F. Schinkel, with colossal marble figures. It leads from Unter den Linden, to the Lustgarten, a park in which stands an equestrian statue of Frederick William III.

The Opera Platz contains statues of five generals, by Rauch, and is bounded by the Palace, University, Opera House, and St. Hedwig's Church, an imitation of the Roman Pantheon. The Schauspielhaus, the leading dramatic theater, is in Gensdarmen Markt. The Schauspielhaus, with the church on each side, is considered one of the finest architectural groups in Berlin.

STATUES AND ART MUSEUMS, ETC.—No city has so many statues and monuments to the national heroes, kingly or military, or to those famed in literature, science and art.

The Royal Library, once in the palace, is now in the new building, built in 1909 on Unter den Linden; it contains nearly five million printed books. The University Library is housed in the same building. There is a large public library and twenty-eight municipal libraries.

DRAMATIC THEATER, GENSDARMEN MARKT

The Royal Museum, in the Lustgarten, north of the Schlossplatz, is divided into the Old and the New Museums, containing the treasures of classical and mediæval sculpture, the Egyptian collection, etc. The Old Museum is the finest building in the city, with a grand Ionic portico, adorned with colossal bronze groups, and richly frescoed halls. It has vast collections of antiquities; the halls of Greek, Roman, mediæval, and modern sculptures; and the Hall of the Heroes.

The New Museum is entered from the Old, and contains Kaulbach's famous mural paintings, the Egyptian museum, an immense collection of casts, twelve cabinets of Northern antiquities four rooms of objects of art, and five hundred thousand engravings. It has a renaissance façade to the east. Opposite is the new Corinthian temple of the National

GERMAN CATHEDRAL, GENSDARMEN MARKT

Gallery, which contains a magnificent and world-renowned collection of ancient and modern paintings.

BERLIN SUBURBS.—In recent years there has been a remarkable expansion of the suburban districts of Berlin, residential sites have sprung up in the pine woods and by the lakes of the Havel to the northwest, and Spandau, Charlottenburg, and Potsdam may almost be regarded as suburbs.

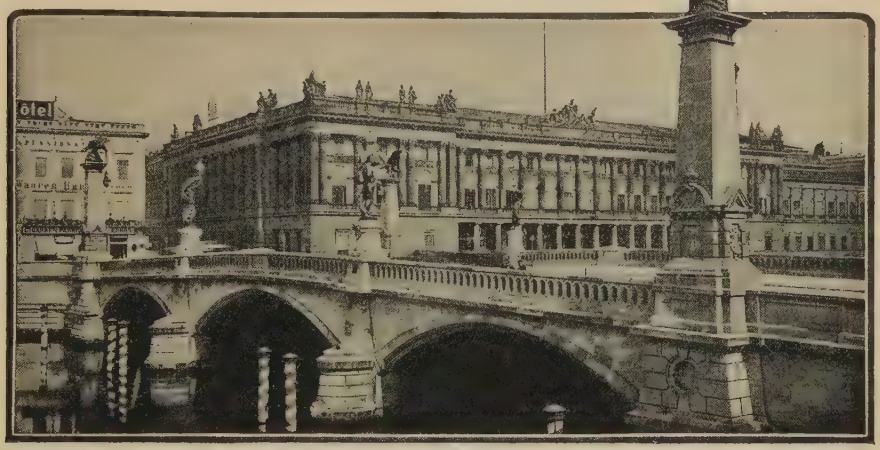
POTSDAM, "the Versailles of Prussia, with its palaces and parks, is sixteen miles from Berlin, among wooded hills and the lakelike expanses of the Havel. Here is the Sans Souci Palace, built by Frederick the Great, and full of reminiscences of him. Near by are the Picture-Gallery, the Orangery (adorned with fine statuary), and the Sicilian Garden. The New Palace has two hundred richly adorned rooms, with fine paintings, and a noteworthy Marble Saloon.

The Marble Palace is north of Potsdam, and has many paintings. Babelsberg is a new Gothic palace, with rich art-treasures. The Royal Palace (1660) is full of relics of the Great Frederick. The Garrison Church contains his tomb and military trophies. The Church of Peace is a noble Ionic basilica, with masterpieces of sculpture. The famous Sans Souci fountains play on summer Sunday afternoons.

INDUSTRIES OF BERLIN.—In its industries Berlin is almost as varied as London, but machinery, especially locomotive and electrical, woolens, dyeing, furniture and metal work are the chief. It is beginning to rival Leipzig in book production, and its breweries are large. Besides being the center of the great trade in corn and other cereals of Eastern Europe, its great banks exercise increasing international influence.

A CENTER OF EDUCATION AND CULTURE.—The famous Freidrich Wilhelm University, founded in 1810, now the largest in numbers in Germany, the splendid technical institution at Charlottenburg, and its numerous schools of all ranks, make Berlin one of the greatest intellectual and educational centers of the world. As the seat of the National Government, and National Parliament and administration, it is also the social center of the nation, and its modern wealth and luxury have made it a growing rival to Paris as a city of pleasure.

Since 1878 the city has been practically rebuilt; the sudden growth of population has resulted in much overcrowding and crushingly high rentals. Once deplorable, the sanitation, water supply, and public hygiene are now of the highest standard, and German scientific thoroughness has made it the most highly organized and best administered city in the world.



THE BOURSE, OR EXCHANGE, BERLIN

ST. HEDWIG'S CHURCH, BERLIN

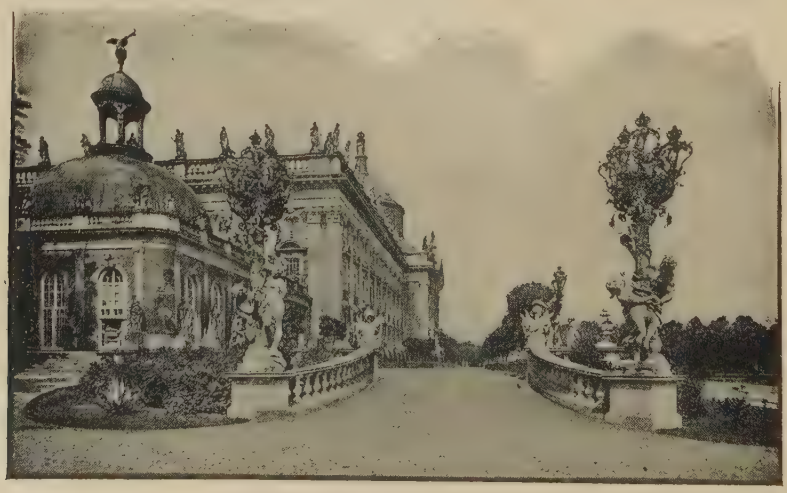
THE NEW PROTESTANT CATHEDRAL, BERLIN

carrying on very extensive manufactures and a great trade by river and railway. It is also the emporium of the flax-growing district of Silesia. About the Rhenish coal fields, which yield half the supply of the kingdom, stand the manufacturing and trading towns of Cologne, Aachen or Aix, Barmen, Düsseldorf, Elberfeld, Crefeld and Dortmund, spinning cotton, wool, linen, and silk; and the famous iron and steel works of Solingen and Essen, where Krupp's steel guns are made.

Magdeburg, on the Elbe, and Cassel, on the Fulda, are the great manufacturing and trading towns of central Prussia. Much of the internal trade of Germany is still carried on at great annual fairs, and in this respect the two Frankforts (on the Main to the west, and on the Oder to the east) hold the most important place. Hanover, on the Leine, is the point of exchange of the mineral products of the Harz for the goods which come in by Bremen on the Weser, and has important manufactures of its own.

The chief ports belonging to Prussia are the Baltic ones —Königsberg, Danzig, Stettin, Stralsund, Memel, Rostock, Wismar, and Kiel, on the Baltic; Altona, on the Elbe, next Hamburg. Posen, on the Warthe, was the ancient capital of Poland, and is the most important fortress towards the Russian frontier. Wiesbaden is the most important and the oldest of the watering-places which have grown up round the mineral springs of Nassau. Eisleben, where Luther was born, and Erfurt, where he resided, both in Prussian Saxony, are notable points in connection with the history of the Reformation in Germany.

Other Prussian Cities.—Breslau on the Oder, the capital of the mining districts of Silesia, has taken rank as the second town of Prussia,



THE NEW PALACE AT POTSDAM

Erected by Frederick the Great, at a cost of $2,250,000. The principal rooms are the Shell Saloon, the rooms of Frederick the Great, the Marble (concert) room, and ball room.

Dresden and Other Cities of Saxony.—Dresden, its capital, finely placed on both banks of the Elbe, famous for its art treasures, has also many varied manufactures. Its architecture and its art collections have given it the name of "the German Florence."

The old bridge, Augustusbrücke (Augustus Bridge), may be taken as the center of the most interesting part of Dresden. Immediately to the east of the Augustusbrücke, on the Alstadt side, stretches the beautiful Brühl Terrasse, whence are fine views over the river. There are high-class concerts in the Belvedere on the Brühl Terrace.

THE ZWINGER, DRESDEN, CONTAINING THE WORLD-RENOWNED GALLERY OF PAINTINGS

Near the flight of steps to the terrace, facing the Royal Palace and Catholic Church, is the Rathaus (Town Hall) with an equestrian statue of King Albert in front.

The Royal Palace, just south of the Augustusbrücke, will be discovered by its lofty tower, three hundred and thirty-one feet high.

The Zwinger, to the west of the Schloss, is a range of buildings of seven pavilions, with the Museum at one corner. In the Museum are the picture gallery, with collections of engravings and drawings, and mineralogical collections, with scientific instruments.

The Picture Gallery is of world renown, containing more than two thousand four hundred paintings, mostly by Italian and Flemish masters. The gem of the collection is Raphael's "Sistine Madonna;" other masterpieces being Titian's "Tribute Money," and Correggio's "Magdalene" and "La Notte."

The Green Vault in the Royal Palace contains an unrivaled collection of precious stones, articles wrought in gold, silver, and ivory, etc. The new Hoftheater is one of the finest theaters in Europe. Of the churches the most noted are the Frauenkirche, with its lofty dome (three hundred and ten feet high).

The so-called "Dresden china" is made for the most part at Meissen, fifteen miles from Dresden.

Leipzig is not only the seat of a famous university and the great book market of Germany, but has one of the largest annual fairs in the world, to which merchants come from all parts of the earth, even from America and China.

Chemnitz and Zwickau, beside the Saxon coal field, are the great woolen and machine-manufacturing towns of Saxony. **Freiberg is famed for its school of mines.**

Cities of Bavaria.—Munich (München), the capital, stands in the midst of a bare elevated plain on the left bank of the Isar, one thousand seven hundred feet above sea-level, but has risen to importance as the central point of the great grain-growing plateau of southern Bavaria. It is the great corn depot of the country, and the place of manufacture of its favorite beer. In recent times it has become celebrated as a seat of the fine arts and for its splendid buildings.

Ancient Nürnburg, with its double line of walls, where watches, first called Nürnberg eggs, were invented, is the great seat of industry and commerce in the north of Bavaria, exporting toys which go to all parts of the world. It stands on the Ludwigs Canal, the most important one in the kingdom, uniting the navigable tributaries of the Rhine and Danube.

Augsburg, on the Lech, northwest of Munich, where the Protestants presented the Confession of Faith to Charles V., is a chief center of Bavarian trade and exchange. Würzburg, on the Main, is the old capital of Franconia, the district which was peopled by colonies of Franks in the sixth century.

Speyer or Spire and the fortress of Landau are also important places in the palatinate.

Cities of Württemberg.—Stuttgart, where Hegel was born, and where Schiller spent his youth, is the capital, and stands next to Leipzig and Berlin in the printing arts and book trade. The fortress of Ulm, on the Danube, where it leaves Württemberg, has a large transit trade. Heil-

THE PINAKOTHEK, MUNICH, FAMOUS GERMAN MUSEUM OF FINE ARTS

bronn is another important trading place. Tübingen is the university town.

The little territory belonging to the house of Hohenzollern, which runs into Württemberg on the south, fell by inheritance to the king of Prussia in 1849.

Cities of Baden.—Free Towns.—Carlsruhe, the capital, and Mannheim, at the confluence of the Neckar and Rhine, are its largest towns. Hiedelberg (north) and Freiburg (south) are the seats of universities. Baden-Baden in the center, is a famous watering-place.

Hamburg, Bremen and Lübeck, the remaining free Hanse* towns, are republics, each governed by a senate and house of burgesses. Each of them has a small territory besides that occupied by the city.

Hamburg, situated on the North bank of the Elbe, is the largest seaport on the Continent, and the third largest in the world. The beauty of the city is much enhanced by the large sheets of water formed by the Alster. The canals in the city are spanned by over sixty bridges, and there are numbers of steam ferries. There are many fine public buildings; notably the Exchange, with its commercial library of over 110,000 volumes; the Rathaus, completed in 1897; the Deutsches Schauspielhaus, completed in 1900; the marine office, and numerous museums of arts, crafts, botany—natural history etc. It has also many fine churches, viz. St. Michael, St. Peter, St. Nicholas, and St. Catharine's, dating from the 15th century. It was the home of Heine, Lessing, Klopstock, Shröder, and other noted writers.

These are the great gates of the external commerce of Germany, and have thus also become important centers for the preparation of foreign products, and of the necessaries of trading (tobacco, sugar-refining, cotton-spinning, shipbuilding). Besides the traffic brought to Hamburg and Bremen by their rivers, all the railways of the northwest converge toward them.

German Colonies.—The following is a list of the principal colonies of which Germany was deprived by the Treaty of Paris, 1919, and placed under mandatories of other nations.

Colonies and Dependencies	Date of Acquisition	Method of Government	Estimated Area Sq. Miles	Estimated Population
In Africa				
Togoland	1884	Imperial Governor	33,700	1,000,000
Kamerun	1884	Imperial Governor	191,130	3,000,000
German South West Africa	1884–1890	Imperial Governor	322,450	120,000
German East Africa	1885–1890	Imperial Governor	384,180	10,000,000
Total African Possessions	1884–1890		931,460	14,120,000
In Asia				
Kiauchau Bay	1897	Imperial Governor	200	33,000
In the Pacific				
German New Guinea				
Kaiser Wilhelm's Land	1885–1886	Imperial Governor	70,000	300,000
Bismarck Archipelago	1885		20,000	
Caroline Islands	1899		.....	
Palau or Pelew Islands	1899		560	56,000
Marianne Islands	1899		250	
Solomon Islands	1886		4,200	
Marshall Islands, etc.	1886		150	
Samoan Islands				
Savii	1899	Imperial Governor	660	37,000
Upolu	1899		340	
Total Pacific Possessions	1884–1899	.....	96,160	393,000

*The Hansa or League of the North German towns was the first trade union of Europe, and dates from the thirteenth century. At one time it included eighty-five towns, and had several foreign factories.

PARLIAMENT BUILDINGS, BERLIN

HISTORY OF GERMANY

The earliest information we have of the Germans, the peoples and the tribes who dwelt among the dense forests that stretched from the Rhine to the Vistula and from the Danube to the Baltic Sea, comes to us from the Romans.

First Contact with Romans.—The first tribes of Germanic race to come into collision with the arms of Rome were the Cimbri and Teutones, who in 113 B. C. had invaded Styria, and there met with defeat from the troops of the consul Papirius. When in 58 B. C. Cæsar began his campaigns in Gaul, he found several hordes of Germans, mostly Marcomanni and Suevi, settled between the Rhine and the Vosges, and even on the western side of these hills.

Appealed to by the Gauls of those regions to free them from their German oppressors, Cæsar inflicted a crushing defeat upon their ambitious chieftian, Ariovistus, and chased him and his followers across the Rhine. In the period 166-74 Aurelius was engaged in beating back a formidable incursion of the Marcomanni and Quadi into Roman territory. From the third century we no longer read of single tribes, but of great confederations of tribes, as the Goths, Alemanni, Franks, Frisians, Saxons, Thuringians, and others. Of the history of Germany itself we learn little more that is authentic until we come down to the times of the Franks, by whom the kingdoms of France and Germany were subsequently formed.

Henceforward, till the time of Charlemagne, Germany was occupied by a number of chieftains, who were perpetually at war with one another, except when invasions from without forced them into transitory alliance.

Charlemagne, or Charles the Great, the Frankish king, was crowned emperor of Rome by the pope in 800, and after his death his empire was partitioned among his four sons, and the result of the family struggles which followed was the separation of Germany from Gaul and of both from Burgundy and Italy by the Treaty of Verdun in 843. (See history of France; also Empire of Charlemagne.)

A separate kingdom of Germany was then formed under Lewis the German. A temporary reunion of the dominions of Charlemagne—with the exception of Burgundy—was effected under Charles the Fat in 884, but he was deposed in 887 and the final separation into the East and West Frankish kingdoms was accomplished.

The inroads of the Norsemen were checked in 891 by Arnulf, but they were followed by the savage attacks of the Hungarians during the reign of Louis the Child, with whom ended the race of Charlemagne in 911.

Under Feudal System.—The royal power had now almost vanished, and the system of granting fiefs had resulted in the formation of a class of powerful local rulers—the dukes of the great groups or confederations of tribes. The maintenance of central authority at all was probably due only to external danger from Slavs, Norsemen, and Magyars, and even this could not prevent constant warfare between the great feudal lords. Conrad of Franconia, elected by the leading nobles, was unable to enforce his authority, and was, at his own suggestion, succeeded by his great enemy, Henry, Duke of Saxony.

Henry I. Establishes Order.—A born leader of men, statesman and general, Henry I. (919-936) introduced a new civil and military organization. He created the burgher class by the foundation of towns, compelling every tenth freeman to labor on buildings, and these towns he made the centers for judicial administration, ceremonies and festivals, markets, and trade. He broke the power of the Magyars, subdued Danes and Slavs, and before his death private war had ceased.

Otto the Great Revives the Holy Roman Empire.—His son, Otto the Great (936-973), consolidated the royal power, and reduced the great Duchies to submission, keeping them in his own hands or in those of members of his family. In 951 he entered Italy to settle the affairs of the Lombard kingdom, but returned to cope with a revolt terminated only by the vital danger of an invasion by the Magyars, whose power was finally crushed in 955. Crowned Emperor by the Pope in 962, he set an example to subsequent German kings, who claimed the Imperial and Lombard crowns as of right; but the precedent led also to the continued absences of the German rulers in Italy and the severance of their interests from those of their own proper dominions. The sense of German nationality grew in his reign, yet this was accompanied by a weakening of central authority and the development of the power of the great vassals, dukes, and princes, ecclesiastical and secular.

Under the House of Franconia.—After his death constant civil war increased their power until their growing independence was checked by Conrad II. (1024-1039), the first of the Franconian Emperors, who rendered the mediate nobles, vassals of the great lords, less dependent on their feudal superiors, and formed a close alliance with the towns. His son, Henry III. (1039-1056), further strengthened the royal power, put down private war, and in 1043 proclaimed a general peace.

THE BRANDENBURG GATE

at the western terminus of the Unter den Linden, was erected 1789, at a cost of three hundred and seventy thousand dollars, after the Propylæa of Athens, and is regarded as the finest archway in Europe next to the Arc de Triomphe at Paris. The Quadriga or four-horse car of Victory, by Schadow, was taken to Paris by the French in 1806, and returned 1814.

Struggle with the Papacy.—His attempted reformation of the Papacy and appointment of four German popes in succession commenced the long and fierce struggle between the Emperors and the Popes. During the minority of his son, Henry IV., the great nobles recovered much of their power. His opposition to the famous decree of Pope Gregory VII. in 1075 against the marriage of the clergy and their investiture by laymen was followed by his summons to Rome, his deposition of the Pope through a synod of German bishops, his excommunication and complete humiliation at Canossa in 1077. The dispute was only settled under his son, Henry V., by a compromise, the "Concordat of Worms," in 1122, but the power of the Papacy had been enormously strengthened. It had attempted to dispose of the Imperial Crown, and Innocent II. even claimed to have granted it to Lothar of Saxony (1125-1137) in 1133 as to a vassal.

Famous Hohenstaufen Line.—With Conrad III. of Franconia (1137-1152) commences the line of the famous Hohenstaufen Emperors. The two great parties supporting the Pope and the Emperor now first became known as Guelfs and Ghibelines (Welfs and Waiblings). His successor, the great Frederick Barbarossa (1152-1190), was occupied in Italy during long years with the now permanent struggle against the Popes and the Italian cities supporting them. In Germany Teutonic power was extended over the Slavonic countries along the Baltic by Henry the Lion of Saxony and Albert the Bear, to whom was granted the Mark of Brandenburg. Under Frederick II. (1212-1250) the struggle with the Papacy was continued. Sentence of excommunication was

launched against him, and a rival king was elected, and his continued absence in Italy led to the utmost anarchy in Germany. Meanwhile the conquest of the Slavonic lands now forming a great part of Prussia progressed steadily under the Knights of the Teutonic Order and of the Order of the Sword.

The period of the Hohenstaufens was one of great brilliancy. Chivalry was promoted in the Crusades, literature was in full bloom in the works of the Minnesänger, Gothic architecture received its finest developments, the towns increased in prosperity, many serfs were freed, and codes of local customs and usages were compiled, such as the Sachsenspiegel and the Schwabenspiegel. On the other hand, the greater vassals became practically independent, and the principle of inheritance was applied to their lands and offices. The privileges usurped by the ecclesiastical and secular princes were confirmed by Frederick II. in the "Pragmatic Sanctions" of 1220 and 1232, and the right of electing the Emperor was confined to the Seven Electors.

The Interregnum.—The period of anarchy culminating in the "Great Interregnum" (1250-1273) is marked by the formation of the Rhenish Confederation of some seventy leading cities for mutual defense, and of the powerful Hanseatic League.

Beginning of the Hapsburg Line.—Rudolf of Hapsburg, elected in 1273, revived the royal authority and strictly enforced justice, but his rule was unfavorable to the growing privileges of the towns. In this respect his policy was reversed by his successor, Adolf of Nassau (1291-1298), and by his son, Albert I. (1298-1308), who even befriended the serfs and the Jews. The long struggle between the Empire and the Papacy practically ended under Louis IV. (1314-1347), by the formal declaration of the Electors in 1338 that the Papal sanction was not needed to the election of the emperor. Public peace was encouraged under Louis IV., and his friendship to the towns was constant. Industry and trade flourished more and more in the cities, and their government was now becoming more democratic through the victory of the craft-guilds over the old patrician families.

House of Luxemburg.—Charles IV. (1347-1378), the first emperor who retained his hereditary lands on election, by the "Golden Bull" in 1356 regulated the method of election and confirmed the complete sovereignty of the Electors in their own territories. In 1396 the foundations of Swiss independence were laid in the victory of the "Eidgenossen" over Duke Leopold of Austria at Sempach.

Reformation Foreshadowed.—In the reign of Sigismund (1410-1437), who united the dignities of King of Hungary, King of Bohemia, and Margrave of Brandenburg, and who was the last Emperor crowned at Rome, the Hussite war, consequent on the burning of John Huss by the Council of Constance in 1415, foreshadowed the Reformation. The Mark of Brandenburg now passed to the Hohenzollerns, under whom it was to grow into the kingdom of Prussia.

The reigns of Frederick IV. (1440-1493), and Maximilian I. (1493-1519), the husband of Mary, the heiress of Charles the Bold, last Duke of Burgundy, bring the Middle Ages to a close. The age of chivalry was ended by the invention of gunpowder and the use of mercenary troops; the realities of feudalism had passed away, the Imperial authority had dwindled to nominal control, and princes and cities had attained independence. But the Imperial dignity was now permanently connected with the House of Hapsburg and combined with great territorial possessions. The semblance and, to some extent, the reality of unity were established by the growing use of Roman law, by the constitution in 1495 of an Imperial Tribunal or Court of Appeal (the "Aulic Council"), and by the division of Germany in 1501 and 1512 into "Circles," each with its own "States" charged to carry out the decisions of the Imperial Chamber.

Period of Charles V.—Luther's denunciation of indulgences was made in 1517, but the full storm of the Reformation burst after the accession of Charles V. (1519-1555), who united to the Empire the entire possessions of the kingdom of Spain. At the Diet of Worms in 1521 he took up the defense of the Church, and condemned Luther as a heretic. At the same Diet an Imperial Administrative Council was established, and a "Matricula" drawn up, settling the contingents of troops to be raised by the States, both of which existed until the fall of the Empire. The Reformation now made irresistible progress; a common name, "Protestants," was acquired by the Reformers at the Diet of Speyer in 1529, and in common statement of doctrines, the "Augsburg Confession," was drawn up in 1530.

Thirty Years' War.—The new and the old religions were put upon an equality by the Religious Peace of Augsburg in 1555, in which, however, the Calvinistic or Reformed Faith was not included. In the fearful struggle which followed the Reformation the Imperial authority was completely ruined. The reaction against the new doctrines, due mainly to the zeal of the Jesuits, gave fresh strength to the Catholic party, the Reformation was stamped out in Bohemia, and complete toleration was not acquired by Protestants (including both Lutherans and Calvinists) until the Peace of Westphalia in 1648.

This was at the close of the disastrous and merciless struggle known as the Thirty Years' war. The result of the confused period commencing with the abdication of Charles V. in 1555 must be briefly summed up. The Empire in Germany was practically ended and was now attached to the hereditary dominions of the house of Hapsburg in Austria. The population of Germany was reduced by more than one-half; industry and trade had almost ceased to exist; enormous territorial losses had been suffered, and France and Sweden had made great acquisitions. Switzerland and the United Provinces were severed from the Empire, and had acquired complete independence. Germany emerged from the war a mere lax confederation of states, whose rulers—a race of absolute and, in most cases, coarse and selfish despots—were recognized by the Peace of Westphalia as independent. Even in the cities government had passed into the

hands of local oligarchies. The only bond of union was the nominal authority remaining to the emperor, and now transferred to the Diet, of passing laws, concluding treaties, and making war and peace. One completely good result of the war was that amid the prevailing anarchy were laid, by Grotius, the foundations of a system of International Law.

Rise of Prussia to Power.—The Thirty Years' war was followed by the rise of Prussia. Brandenburg had in 1611 become united to the Duchy of Prussia, part of the possessions of the Teutonic Order, which was in 1657 declared independent of Poland, of which it had been a fief, and received further accessions under the Great Elector, Frederick William. It grew steadily in power during the long struggle against the unscrupulous aggressions of Louis XIV., and in 1701 the son of the Great Elector, Frederick I., obtained from the Emperor the recognition of the Prussian Duchy as a kingdom. In 1713 a "Pragmatic Sanction" was drawn up by the Emperor Charles VI. (1711-1740), providing for the inheritance of the Austrian dominions by his daughter, Maria Theresa, and this was ultimately guaranteed by the leading powers.

Frederick the Great and the Seven Years' War.—But his death in 1740 was the opportunity of Prussia, where Frederick II., better known as Frederick the Great, had just ascended the throne. He immediately occupied Silesia. Maria Theresa met with enthusiastic support in Hungary, and in 1745 her husband was elected emperor as Francis I. (1745-1765). An interval of peace was followed by the Seven Years' war, at the conclusion of which, in 1763, Prussia was confirmed in the possession of Silesia, took rank as a great Power, and became definitely the rival of Austria in German politics.

In 1765 Joseph II. succeeded to the imperial crown, becoming at the same time co-regent with his mother of the Austrian hereditary dominions. He joined with Russia and Prussia in the first partition of Poland (1772). He was succeeded by his brother Leopold, who, having died in 1792, was succeeded by his son, Francis II., who joined in 1793 in the second partition of Poland. He took the command of his army against the French in 1794, concluded the peace of Campo Formio with Bonaparte (1797); joined the second coalition against France in 1799, and concluded the treaty of Lunéville (1801).

In 1804 Francis took the title of hereditary emperor of Austria, renouncing two years later that of head of the German Empire, which, indeed, had ceased to exist, owing to the conquests of Napoleon. The latter's secularization of the ecclesiastical states, overthrow of Austria at Austerlitz (1805) and of Prussia at Jena and Auerstädt (1806), and formation of the Confederation of the Rhine, completed the extinction of the Holy Roman Empire.

The German Confederation.—The states of Germany were again united by the treaty of Vienna (1815), in a confederation called the German Confederation (*der Deutsche Bund*). In 1818 a general commercial league, called the Zollverein was projected by Prussia, and was gradually joined by most of the German states, exclusive of Austria. Revolutionary outbreaks caused great disturbances in various German states in 1830 and 1848, particularly the latter. The German Diet was restored in 1851 by the efforts of Prussia and Austria, who were latterly rivals for the supremacy in the confederation.

Beginning of Bismarck's Power.—In 1861 William I. succeeded to the throne of Prussia, and the conflicts between the liberals and his ultra-reactionary government led in 1863 to the entrance into the ministry of Otto von Bismarck, who soon after became its president and the minister of foreign affairs. On the death of Frederick VII. of Denmark, Prussia and Austria disputed the claims of Christian IX., his successor, to the duchies of Schleswig and Holstein, and the war which followed (1864) resulted in the cession of Schleswig-Holstein, and Lauenburg to those powers jointly.

By the treaty of Gastein, Austria and Prussia agreed to a joint occupation of the Elbe duchies; but to prevent collision it was judged prudent that Austria should occupy Holstein, and Prussia Sleswick.

Contest Between Prussia and Austria.—Already a difference of policy had begun to show itself. Prussia was believed to have the intention of annexing the duchies; while Austria began to favor the claims of Prince Frederick of Augustemburg. In the meantime, both nations were making ready for the struggle; and Italy, looking upon the quarrel as a precious opportunity to strike a blow for the liberation of Venetia, had secretly entered into an alliance with Prussia.

On July 3, 1866, was fought the decisive battle of Sadowa, in which the Austrians were routed. Not till the victorious Prussians had pushed forward towards Vienna was a truce obtained through the agency of the Emperor of the French, the Peace of Prague (August 20). Italy, though more than half-inclined to stand out for the cession by Austria of the Trentino, as well as Venetia, reluctantly agreed to the armistice (August 12).

A brief campaign sufficed for the defeat of the minor states of Germany that had joined Austria, viz.: Bavaria, Württemberg, Baden and Hesse-Darmstadt; and, after peace had at last been arranged, some of them were forced to submit to a certain loss of territory.

Independence of Austria and Union of Germany.—The war completed the dissolution of the Confederation, and secured the reconstruction of Germany on an entirely new basis. Austria was excluded from Germany, and a new confederation, the North German, was formed of the states north of the Main, under the headship of the king of Prussia. Schleswig-Holstein, Hanover, Hesse-Cassel, Nassau, and Frankfort were incorporated with that kingdom. Efforts to secure a further consolidation were opposed by the South German states, but the final solution of the question was at length brought about by France, whose demands resulted in the War of 1870. (See under France.)

In this war Germany acquired Alsace and a part of Lorraine, and south Germany now

waived any further opposition to a consolidation of all the German states under the leadership of Prussia.

Restoration of the German Empire.—On December 3 the king of Bavaria invited the king of Prussia to restore the dignity of German emperor. Most of the other states gave their assent and the North German Reichstag on December 10 adopted a motion for the establishment of the German empire under the king of Prussia. On January 18, 1871, the restoration of the imperial dignity was solemnly proclaimed by William I. at Versailles.

Subsequently the empire was largely organized under the vigorous administration of Prince Bismarck. The parliament of the new empire soon met at Berlin, and adopted the new constitution. The main result of his foreign policy was a cordial alliance with Austro-Hungary; an alliance, in 1872, between the emperors of Germany, Austria and Russia, in which, subsequently, Italy took the place of Russia, forming what is known in European politics as the Triple Alliance.

In domestic affairs many difficulties were encountered. With the birth of the new Empire commenced the long struggle of Prince Bismarck with the Papacy. The Jesuits were expelled in 1872, and in 1873 the famous "Falk Laws" imposed secular restrictions on all ecclesiastical appointments. The strict enforcement of these laws led to intense discontent and ill-feeling among Catholics. The contest ended with the grant of many concessions and the confession by Prince Bismarck in 1887 that his policy was practically changed. The democratic movement known as Socialism, aiming at the regulation and organization by the State of labor and production, grew rapidly in strength and importance, and inaugurated an era of "labor policy" by legislation compelling employers to institute a system of insurance in favor of their work-people, since followed by the adoption of an important state-aided scheme of insurance against death and old age.

In 1888 Emperor William I. died, and the premature death, after a reign of three months, of the beloved Crown Prince, who succeeded him as Frederick III., disappointed the hopes of those who had anticipated a Liberal policy on the part of the Crown.

Accession of William II.—His son and successor, William II., took a strong view of his functions as emperor and king. His reign was immediately characterized by the further development of the labor policy inaugurated by Prince Bismarck. The emperor was not, however, generally in accord with the views of the great Chancellor, whose resignation was accepted in 1891.

Caprivi now became chancellor, and managed to negotiate a series of commercial treaties, in 1892-1894, with the countries of Central Europe (Austria, Belgium, Switzerland, Italy), and later with Servia and Roumania, the purpose of which was to lower the import-duty on corn on condition that the foreign states favored German manufactures. These treaties at once induced the peasants to combine and in 1893 a great agricultural union was formed, called the *Bund der Landwirte*, with which an older association, the *Deutsche Bauernbund*, almost immediately coalesced.

Commercial and Colonial Expansion.—But the great features of recent German history have been the growth of German trade and commerce, the great colonial expansion in Africa and Polynesia, and the rapid increase of her navy.

In 1905 Germany intervened to disturb the French policy in Morocco, resulting in a conference of the powers interested at Algeciras. In 1911 Germany again intervened by sending a warship to Agadir for the protection of German property and German subjects. The action occasioned a complication of the European situation, and all but resulted in war. Germany's claim for territorial compensation was not entertained by France, and Great Britain, as ally of France, claimed the right to be consulted if territory were to be conceded. The net result, after months of diplomatic intercommunication, was a readjustment of frontiers.

The history of the German Empire since 1914 is chiefly that of the leading Teutonic power in the great European War that ended with the armistice of November 11, 1918. (See further under European War.)

MONUMENT OF VICTORY, BERLIN

Erected in the Königs Platz at the conclusion of the Franco-Prussian war of 1871. It consists of a circular temple surrounded with a colonnade of sixteen pillars, standing upon a square base or pedestal, and surmounted by a cylindrical shaft bearing a colossal gilt bronze Victory, winged and holding a wreath. The total height is one hundred and ninety-four feet. It may be ascended by an interior staircase. Upon the base are elaborate reliefs of the various campaigns commemorated.

ST PETER'S, ROME

St. Peter's is the largest church in the world, covering two hundred and forty thousand square feet. It cost over sixty million dollars, took one hundred and seventy-six years to build; contains many vast and beautiful chapels, tombs of the popes, many paintings by great masters, and sculptures by Bernini, Michaelangelo, Canova and Thorwaldsen.

KINGDOM OF ITALY

Modern Italy occupies the central of the three great peninsulas of southern Europe, together with Sicily, Sardinia, and some smaller islands. The peninsula, which at the Strait of Otranto approaches within less than fifty miles of Albania, is bounded west and south by that portion of the Mediterranean known as the Tyrrhenian Sea, east by the Adriatic, and north by the Alps, separating it from France, Switzerland and Austro-Hungary. The frontier with France is estimated at three hundred and seven miles; with Switzerland at four hundred and seven miles; and with Austria at four hundred and sixty-six miles. Its greatest length is seven hundred and ten miles; the breadth ranges from three hundred and fifty-one miles in the north to about twenty between the Gulfs of St. Eufemia and Squillace, but in most places is about ninety or one hundred miles. The seaboard of the peninsula extends to two thousand two hundred and seventy-two miles.

Mountains and General Configuration.—On the northern frontier the Alps sweep round in a mighty arc from Nice to Trieste, running out in places into Piedmont, Lombardy, and Venice. For the most part they rise steep and abrupt, except where their wall is pierced by long, deep valleys; and some of the loftiest peaks in the system, including Mont Blanc and Monte Rosa, belong to this mountain-girdle.

The highest mountain entirely within the kingdom is Gran Paradiso, the culminating point of the Graian Alps, in Piedmont. Between the Alps and the Apennines spreads the broad fertile Lombardo-Venetian plain, a nearly level country, which differs altogether in character from the peninsula to the south, and for a long period was politically distinct from it. Most of this great alluvial tract, which fills nearly the whole of northern Italy, belongs to the basin of the Po; it is irrigated by numerous streams and canals, and is one of the most fruitful and flourishing districts of Italy.

This great northern plain—generally but a few feet above sea-level—round which the Alps rise like a wall, is believed to have been at one period an extension of the Adriatic Gulf, which has been gradually filled up with rich alluvial soil worn down from the steep sides of the mountains by the snow-fed torrents.

The Apennines.—The form of all the more strictly peninsular part of Italy is given by the central range of the Apennines, which extends continuously through its length from the maritime Alps of France, round the head of the Gulf of Genoa, down to Cape Spartivento in the extreme south. The Apennines have their highest part, called the Gran Sasso d'Italia, "the great rock of Italy," near the center of the long range. The slopes of these heights to the sea, northeast and southwest, are so short as to allow of only small rivers.

Nearly parallel with the southern part of the Apennine range, and westward of it, there appears a more recent chain of isolated volcanic heights. Chief of these, on the peninsula, is the cone of Vesuvius, which rises abruptly from the Campagna of Naples, above the old cities of Herculaneum and Pompeii, buried by its lava streams and ashes. North of Rome, in this volcanic region, the round lakes of Bolsena and Bracciano occupy the craters of old volcanoes. Carrying the line southward, across the Tyrrhenian Sea, we come to the volcanic group of the Lipari Islands, with the ever-active volcano of Stromboli; and farther on to Mount Etna, in Sicily, the highest of European volcanoes. Almost all the rest of Sicily, not volcanic, is covered with mountains of moderate elevation, the main line of which extends along the northern side of the island from east to west as if in continuation of the course of the Apennines across the narrow Straight of Messina.

Islands and their Surface.—The island of Sardinia, separated from Corsica by the Strait of Bonifacio, one hundred and fifty miles long from north to south, is for the most part mountainous, especially along the eastern side, in the middle of which rises the granitic Mount Gennargentu.

The island of Elba, famous as the place of Napoleon's exile, between Corsica and the peninsula, eighteen miles long, is high, its western part being formed by Mount Capanne, which rises to three thousand three hundred and twenty-three feet. Capri, south of the Bay of Naples, where the Emperor Tiberius passed the last ten years of his life, and Caprera, Garibaldi's home, on the north coast of Sardinia, are other noteworthy islands.

Rivers and Coast Waters.—The principal rivers are fed from the Alpine lakes. The Po, which descends from Monte Viso, on the western frontier, and, as it sweeps across the plain, receives the contributions of numerous important streams, ranks for its volume of water among the notable rivers of Europe. It is navigable for three hundred and twenty out of its four hundred and twenty miles, and several of its tributaries are also navigable. Many of the Po's tributaries spread out at the foot of the Alps.

The province of Venice, to the north and east of the Po, is traversed by the Adige, Brenta, Piave and Tagliamento.

Along the coast of the Adriatic, north and south of the Po delta, there exist large tracts of salt water, known as lagoons, in a flat and marshy district. They are separated from the sea by narrow banks of sand in which are inlets, so that the lagoons serve as harbors. The chief of these is that in which Venice is situated. It extends over nearly forty miles from Torcello in the north to Chioggia and Brondolo in the south. The other coast-line of northern Italy is formed by a narrow strip of land, closed in by the steep, abrupt rocks of the Apennines, and known as the Italian Riviera.

The Arno, next to the Tiber the most considerable river of central Italy, rises on Mount Falterona, an offset of the Apennines, at four thousand four hundred and forty-four feet above sea-level, and twenty-five miles north of Arezzo. It flows one hundred and forty miles westward to the sea, eleven miles below

Pisa. At Florence it is four hundred feet wide, but is fordable in summer.

The Tiber, the chief river of central Italy, and the most famous in the peninsula, rises in a dell of the Tuscan Apennines, eleven miles north of the village of Santo Stefano, whence it winds two hundred and sixty miles, and enters the Mediterranean by two branches, which enclose the Isola Sacra. Towns on or near its banks are Perugia, Orvieto, Rome and Ostia. It is navigable for boats of fifty tons to the confluence of the Nera, one hundred miles from its mouth. The Tiber is supplied mainly by turbid mountain-torrents, whence its liability to sudden overflowings. Its waters, too, are still discolored with yellow mud, as when the poet Horace described it.

Lakes.—To the south of the Alps, in the north of Lombardy and Venice, lie the beautiful Italian lakes, Lago di Garda, Maggiore, Como, Lugano, and Orto.

Lake of Como, the Lacus Larius of the Romans, is generally considered the most beautiful of the group. It is about thirty-six miles long, and its greatest width is three miles. Its shores are studded with picturesque villages and charming villas, with a background of forest and mountains, some of which are seven thousand feet high. The loveliest point is Bellagio, where the lake divides into two arms. Cadenabbia, on the western shore opposite Bellagio, is also a pleasant place.

Como, at the other extremity, is a thriving town of twenty-five thousand inhabitants, the birthplace of Pliny the Younger and of Volta. The cathedral is one of the best in Northern Italy.

Lake of Lugano, between Como and Maggiore, though much smaller than either, is scarcely their inferior in the loveliness of its scenery. It lies at the southern foot of the Alps, eight hundred and eighty-nine feet above sea-level. Its length is fourteen and one-half miles; average breadth one and one-quarter miles; area nineteen and one-half square miles; maximum depth nine hundred and fifteen feet, and average depth two hundred and forty-six feet.

Lake Maggiore (*Madjō'ray*), the largest of the Italian lakes, is about forty-five miles in length, averages three miles in breadth, lies six hundred and forty-six feet above sea-level, and has a maximum depth of one thousand two hundred and fifty feet. The river Ticino flows through it. In a southwestern expansion of the lake are the Borromean Isles. On the Isola Bella is the large palace built by Count Vitaleo Borromeo about a century ago, with terraced gardens, fountains, grottoes, etc., all very elaborate and artificial.

Lake Garda, a beautiful, clear lake, lies between Lombardy and Venetia, its northern end extending into the Austrian Tyrol. Situated two hundred and twenty-six feet above sea-level, it has an area of one hundred and fifteen square miles, a greatest length of thirty-five miles, a breadth of two to eleven miles, and a maximum depth of nine hundred and sixty-seven feet. The surface is studded with many islands. It is drained by the Mincio, a tributary of the Po. The mild climate and the beauty of the vicinity have caused its shores to be lined with villas.

Climatic and Landscape Features.—The north of Italy has the excessive climate of the temperate region of continental Europe; in the central parts of the peninsula the climate becomes more genial and sunny, and to the south almost tropical. The plain of Lombardy, with an average temperature of fifty-five degrees Fahrenheit, has winters which are as cold as those of the Scottish lowlands, and the lagoons of Venice have been frozen over; but its summers are as hot as those of Rome or Nice. The changes are few; rain lasts for weeks together in autumn, but in summer the blue sky is never clouded except when a violent thunder and hailstorm occurs.

About Florence the winters are much milder, with the same summer heat, and this difference between the seasons decreases still more to southward.

The summer of the Campagna of Rome, when a heat mist rises over the plain, is almost unbearable; in January the sky is blue, the mornings may be frosty, and fresh spring air blows over the land; in March the trees are already leafy, and in June the harvest begins; in July everything withers under the excessive heat, till the autumn rains revive the land.

In Naples and South Italy the sky is cloudless for months together, and the air is so pure that distant plains appear to be close at hand.

The chief faults of the Italian climate are the cold mountain winds called the Tramontana, like the mistral of south France, and the Bora of the north Adriatic, and, in contrast, the hot Sirocco, which occasionally blows from the African deserts, besides the malaria of the western coast marshes and of the Venetian lagoons.

Round the lakes at the base of the steep southern slope of the Alps, Mediterranean forms of vegetation appear; the chestnut reaches up to two thousand five hundred feet; above that comes the belt of beeches and oaks, still higher the pine woods, then the pretty alpine plants and high pastures. Scarcely any part of the world is so covered with irrigating canals as the highly cultivated plain of Lombardy, so that the whole of it appears like a great garden. At the northern base of the Apennines the Mediterranean flora of laurels and myrtles, cork oak and cypress, covers the first slopes; above that groups of oaks appear, then beech woods and the extensive summer pastures which reach all over the Apennine range. The Apennines have no permanent snows, but their highest summits are frequently snow-clad between October and May, and send down cold breezes into the warm valleys.

In Sicily the vegetation takes an African character, and many tropical forms flourish; it is not a well-wooded island, but forests occur here and there.

Riviera (*Ree-vee-ay'ra* "seashore"), is a term applied to the narrow strip of coast-land bordering the Gulf of Genoa, strictly from Nice to Spezzia, but generally understood to include the whole coast of the Alps Maritimes, and the Italian coast as far as Leghorn.

West of Genoa, and extending into France, it is called the Riviera di Ponente, or western coast, and beyond Genoa the Riviera di Levante, or eastern coast. From Hyères to Genoa is two hundred and three miles; from Genoa to Leghorn one hundred and twelve miles. Sheltered on the north by mountains, the district enjoys an exceptionally favored

climate, no other region north of Palermo and Valencia being so mild in winter.

The western section is the mildest and most frequented. It abounds in the most striking and beautiful scenery, and is planted with numerous health and fashion resorts—Nice, Monaco, Mentone, Ventimiglia, San Remo, Bordighera, etc.; and west of Nice are Hyères, Fréjus, Cannes, Gresse, Antibes.

The famous Corniche (Ital. *Cornice*) road, widened by Napoleon I., leads along the Mediterranean coast from Nice to Genoa, and commands magnificent views.

Products and Industries.—Of the whole surface of Italy it is estimated that eighty-three per cent is suitable for cultivation. The greatest proportion of agricultural land, however, lies in the great plain of Lombardy and the Campagna Felice of Naples. Notwithstanding this, the supply of corn grown in Italy is not sufficient for its wants, and more is imported from Russia, Egypt and North America. Maize and wheat afford the staple food of the lower classes, as polenta and macaroni.

Agriculture and Stock-Raising.—A sixth of the area of the kingdom is covered with wood or bush, the island of Sardinia having the largest forests of all the kingdom—the districts of Lake Como, of southern Tuscany, and Genoa, being the best wooded parts of the mainland. The olive grows all over peninsular Italy, and enormous quantities of oil are produced, much being exported.

All parts of the country are suited to vine-growing. Most wine, however, is made in south Italy and Sicily. Most horses are bred in Lombardy, where cattle are also numerous on the dairy farms, which supply enormous quantities of cheese. Tuscany has most sheep; Sicily the finest mules and asses; Umbria the greatest number of swine. Coral fishers go out from Naples, Leghorn (Livorno), and Genoa to the coasts of the Balearic Isles and of Algeria and Tunis in large numbers.

Minerals. — The most important mineral product of Italy is the sulphur of Sicily; iron is widely distributed, but is obtained in most considerable quantity in Lombardy and Liguria; lead is an important product of Tuscany; sea salt of the vicinity of Cagliari, the chief town of the island of Sardinia. Famous pure white marble is quarried at Carrara and Massa, on the northwest coastland of Tuscany.

Manufactures.—The zenith period of Italian manufactures, when Milan was famous for its wool-workers, Venice for its dyes, Florence for its cloth, has long since passed away, and in this respect Italy now occupies a low position.

Silk-growing, spinning, and weaving it, is now the most important branch, and in this the towns of Lombardy—Bergamo, Como, Milan, Turin—take the lead, followed by those in the plain round Naples, and by Catania and Palermo in Sicily. Glass-making has also fallen from its old position; the works at Intra, on Lake Maggiore, and the manufacture of beads and mosaics at Venice, are, however, still very important. Porcelain is made chiefly at Milan and Florence; straw hats at Vicenza, in Venetia, and in Tuscany, whence they come to us as Leghorn hats, from the port at which they are shipped.

People and Language.—The present Italian people have arisen from a perfect chaos of races. The ancient Ligurians of Iberian race and the Umbrians of the north were joined, from an unknown quarter, by the strange people called Etruscans or Tuscans by the Romans, who exercised such an immense influence on European civilization. The Greeks peopled the south, and held Sicily along with the Phœnicians; the Romans spread out from the center of the peninsula to extend their conquests far beyond its limits; then the Goths and Franks poured in from the north, and after them the Longobards, who gave their name to Lombardy. The Savoyards and Waldenses of the valleys of Piedmont along the French border appear to be of Gallic descent. Insular Sardinia was free from the irruptions of the northern people, but came under the influence of the Greeks, the Arabs, and then of the Spaniards.

Here, as in France and Spain, the Roman language endured and prevailed over all others, and now the people of Italy have one language and literature, the Italian, descended from the Latin. Its dialects show traces of the mixture of nationalities, but the Tuscan has now become classic, for the great writers, like Dante and Boccassio were Tuscans.

Religion.—The Roman Catholic Church is reorganized as the state church, but toleration is granted to all creeds. Over ninety-seven per cent of the population is Roman Catholic. By the Act of 1871 the rank of the Pope as a sovereign prince is recognized, the Vatican and Lateran palaces and the papal villa at Castel Gandolfo having the privilege of exterritoriality. Protestants number about sixty-six thousand, which include some twenty-two thousand Waldensians; and there are about thirty-eight thousand Jews, and about two thousand five hundred members of the Greek Orthodox Church.

Education is controlled by the state under a minister of public instruction, assisted by a council. Primary education is free and compulsory, and the state also maintains, partly or wholly, secondary, technical schools, and the universities. There are thirteen universities. Private schools may not be opened without state authorization.

Cities.—The largest city is Naples. Rome is the capital. Milan, Turin, Palermo, Genoa, Florence, rank next. There are four others with about one hundred and fifty thousand, and twenty-three towns over fifty thousand.

ROME, the "city of the seven hills," contains more objects of interest than any other city in the world. It is situated mainly on the left or east bank of the Tiber, about fifteen miles from its mouth. The river, which has here an average breadth of two hundred feet, is spanned by eleven bridges in its course from north to south through the city.

The Seven Hills.—On the left bank rise the famous seven hills of ancient Rome, which, from north to south, are the Aventine, Cœlian, Palatine, Capitoline, Esquiline, Viminal, and Quirinal. These hills rise from eighty to one hundred and twenty feet above the river and the intervening valleys.

VIEW OF ROME FROM ST. PETER'S

The Royal Palace and chief public offices are upon, or adjoin, the Quirinal Hill. The Aventine and the Cœlian are, in large part, not built upon. The Esquiline and Viminal are modern industrial quarters. The Palatine, with the Forum below it on the east, are covered with important ancient ruins. The Capitoline, crowned by the Capitol, the most imposing of the hills, the center of ancient life and worships, has, apart from the new monument of Victor Emmanuel, suffered little change since the sixteenth century.

Mediæval and Rome occupies chiefly the plain, known as the Campus Martius of ancient times, nearer the river, and on the slopes of the Pincian Hill, to the north, extending thence eastward to the Quirinal and Viminal. The smaller part of Rome, on the right or west bank, comprises the Borgo, or district, containing St. Peter's, the Vatican, the Castle of St. Angelo, and the Janiculum Hill, to the north, with the Trastevere quarter, to the south.

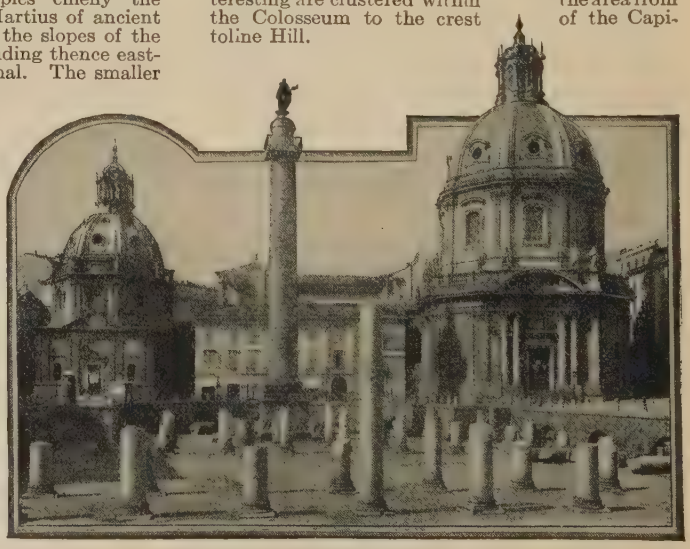
The entire city is surrounded by a wall fourteen miles in circuit, with thirteen gates, the wall on the left bank being substantially identical with Aurelian's Wall, built in the third century; while the Leonine Wall round the Borgo was extended in the early sixteenth century.

Modern Features and Districts.—The business part of the city occupies the plain on the bank between the hills and river, traversed by the Via del Corso, the principal thoroughfare in Rome, about a mile in length, leading from the Porto del Popolo to the foot of the Capitoline Hill, where is situated the great National Monument to Victor Emmanuel. From the Piazza del Popolo two great streets diverge on either side of the Corso, the Via di Ripetta to the right, skirting the Tiber, and to the left the Via del Babuino, leading to the Piazza di Spagna, whence the Scala di Spagna, the resort of artists' models, ascends to the Pincian Gardens, on the site of the gardens of Lucullus, which command a splendid view of the city, and form the fashionable drive and promenade.

Of the new streets the most important are the Via Venti Settembre, the Via Cavour, and the Via Nazionale. The older foreign quarter lay at the foot of the Pincian, around the Piazza di Spagna, but the healthier sites on the slopes and summits of the Quirinal and Esquiline are now more frequented.

Rome abounds in open Squares (*Piazzas*) adorned with fountains, obelisks, or statues. Eleven Egyptian obelisks still ornament the gardens and piazzas of Rome, brought by Augustus and others. That in the Piazza of St. John Lateran, one hundred and four feet in height, is the largest in existence. It was erected at Thebes by Thothmes III., and removed by Constantine to the Circus Maximus. The triumphal arches of Septimius Severus, of Titus, and of Constantine are still conspicuous. Of the bridges over the Tiber, three are ancient.

The antiquities are legion, some of the most interesting are clustered within the area from the Colosseum to the crest of the Capitoline Hill.

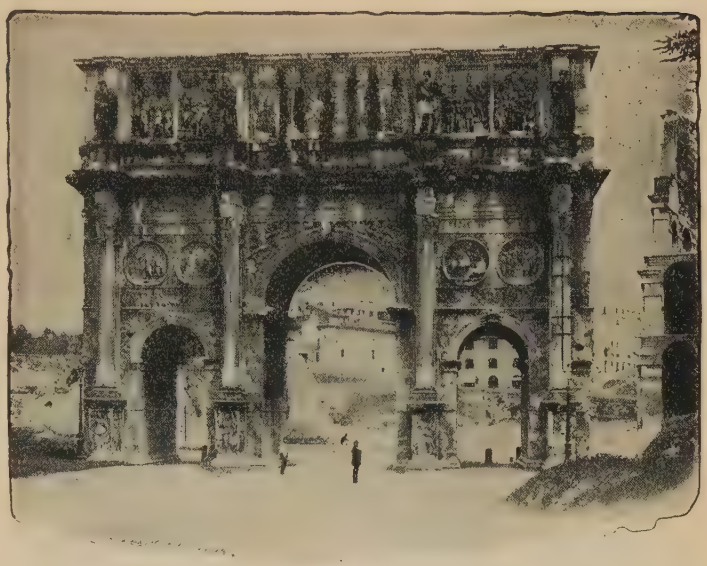


SITE OF THE FORUM OF TRAJAN

The Forum consisted of three parts: the forum proper, the huge Basilica Ulpie, and the temple of Trajan, with it colonnaded inclosure. It was once the grandest building in Rome. Trajan's Column, still standing, is a Roman Doric column of marble, on a square basement, the total height, exclusive of the present statue of St. Peter, being one hundred and twenty-seven and one-half feet. The entire shaft is occupied by vigorous and lifelike reliefs ascending in a spiral, representing Trajan's campaigns. The reliefs contain about two thousand five hundred human figures, besides those of animals and inanimate objects.

Famous Architectural Edifices, Ancient and Modern.—The remains of ancient Rome have suffered severely from the vandalism and the neglect of past centuries, but they are now carefully preserved. The Forum, in some places nearly forty feet below the present street level, has been in great part excavated, and near it are many vestiges of by-gone Roman splendor, including columns, arches and ruins of temples.

ROMAN FORUM.—In remote times, the marshy ground which later became the site of this famous Forum served as *neutral territory* whereon both the Romans (who occupied the Palatine Hill), and the Sabines (who occupied the Capitoline Hill) could meet. Gradually it became a market-place and an exchange, till, at length, all the important business of Rome and of the Empire came to be concentrated in and about the Forum.

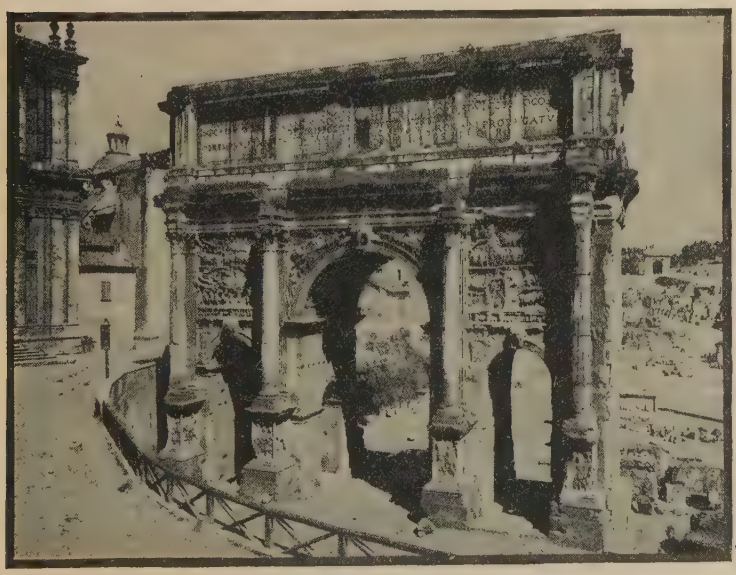


ARCH OF CONSTANTINE

Built in 312 A. D. in honor of Constantine's triumph over Maxentius. Much of its abundant sculpture was taken from the destroyed church of Trajan.

A portico was built around the Forum, the first story being devoted to shops and the second to offices for the collection of taxes. After some centuries, these were destroyed by fire, when various basilicas and temples were erected in their places. The Forum existed as such till the eleventh century, A. D., when it was totally destroyed by Robert Guiscard. Becoming then a waste, the rubbish of the city was thrown there until the entire space was filled to the depth of twenty-four feet and the location and names of the ancient buildings lost. In the revival of learning, in the sixteenth century, interest began to be awakened in the ruins of ancient Rome, and, in 1547, excavations of the Forum were commenced, under Paul III., which, with much irregularity have continued to the present day.

The most conspicuous remains of the Forum are the columns of the Temple of Saturn, the temples of Castor and Pollux and of Vesta, and on its northern side the arch of Septimius Severus, the Curia, the Basilica Æmilia, and the temples of Antoninus and Faustina and of Romulus. In the middle of the eastern part rose the temple and forum of Julius Cæsar. The more ancient and famous forum from which Cicero spoke was at the western end.



ARCH OF SEPTIMIUS SEVERUS

An arch in the Roman Forum, dedicated 203 A. D., in commemoration of victories over the Parthians. It is of Pentelic marble, with a central arch and two side arches, flanked by four Corinthian columns on each face. There are panels over the side arches and a frieze above all with reliefs of Roman triumphs.

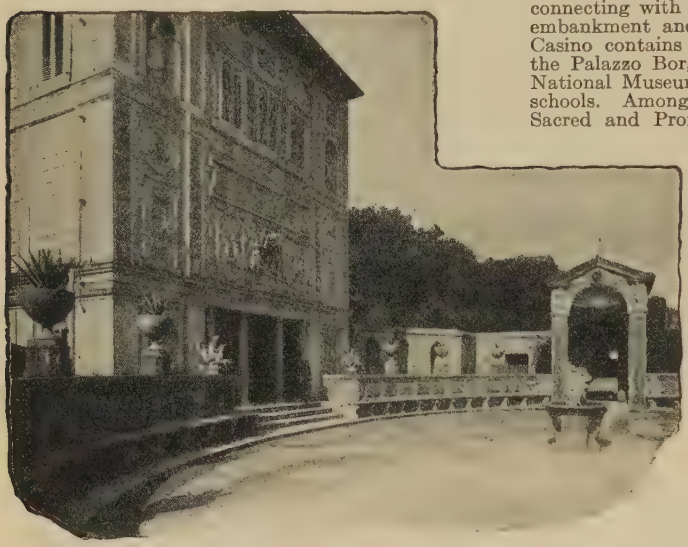
The latest excavations in the Roman Forum, including the stele and black stone of Romulus, the Basilica Æmilia, the Chapel of Santa Maria Antiqua, and the House of the Vestal Virgins, are of extraordinary interest.

It was traversed by the *Via Sacra*, a winding road which led from the southern gate of Rome to the Capitol, and was the route by which triumphal processions passed to the Temple of Jupiter. The Arch of Titus was at its summit. The great blocks of lava with which this road was paved still, for the most part, remain.

Beyond it stands the great Column of Trajan, one hundred and twenty-four feet in height, with spiral bas-reliefs repre-

senting scenes from Trajan's campaigns against the Dacians, forming the most instructive historical monument in Rome.

Palaces and Art Collections.—THE VATICAN PALACE, the residence of the pope, adjoining St. Peter's, enjoys along with the Lateran the privilege of "exterritoriality." The massive building, said to include eleven thousand apartments, contains the finest extant collection of ancient sculpture, with many celebrated statues, a rich gallery of paintings, a famous library, and other collections, besides the Sistine Chapel, adorned with frescoes by Michaelangelo and other masters, and the Stanze and Loggie, with paintings by Raphael and his contemporaries.



VATICAN PALACE AND GARDENS

THE QUIRINAL PALACE, another huge pile on the hill of that name, is occupied by the king. In the Piazza del Quirinale are two famous marble groups of Horse-Tamers.

THE VILLA UMBERTO PRIMO, formerly Borghese, outside the Porta del Popolo, is noted for its beautiful grounds, which are a favorite promenade connecting with that on the Pincian Hill by an embankment and bridge opened in 1908. The Casino contains the picture-gallery formerly in the Palazzo Borghese. It is now an important National Museum, and is arranged according to schools. Among the masterpieces are Titian's Sacred and Profane Love, Raphael's Entombment, Correggio's Danaë, etc.

THE PALAZZO BARBERINI, built by Urban VIII., is a large and magnificent structure, but chiefly notable for a small picture-gallery, the gems of which are Raphael's Fornarina, and Guido's Beatrice Cenci. The library contains seven thousand manuscripts, many of which are rare.

VILLA MEDICI (*ma'de-che*), was built in 1540, south of the Pincio, for Cardinal Ricci. About 1600 it came into the possession of the Medici family, and afterward into that of the grand dukes of Tuscany. Galileo was confined there 1630-1633. The French Academy of Art, founded by Louis XIV., was transferred to it in 1801, and it has a fine collection of casts.

PALACES OF THE EMPERORS.—On the western side of the Forum Romanum rises the Palatine Hill, its summit covered with the substructures of the Palaces of the Emperors, the Houses of Augustus, of Tiberius, of Livia, of Caligula, of Domitian, and of Hadrian. Most magnificent of all is the Palace of Septimius Severus, rising in seven stages of massive masonry, which form a southern extension of the Palatine Hill.

Besides these imperial palaces, the Palatine included a magnificent Stadium, the most perfect in existence, imperial reception halls, several temples, with gardens, baths, barracks for soldiers, and a basilica or hall of justice, in which St. Paul must have pleaded before the emperor.

THRONE ROOM OF THE POPE, VATICAN PALACE

The Golden House of Nero, built on the opposite side of the Forum, and occupying the greater portion of the Oppian Hill, was demolished to make room for the Colosseum and the Baths of Titus.

THE COLISEUM (or Colosseum), originally called the Flavian Amphitheatre, was begun by Vespasian in A. D. 72, and dedicated by Titus eight years later. It was built for gladiatorial exhibitions and for the combats of wild beasts. It is the largest structure of the kind ever built, being capable of seating from forty to fifty thousand spectators. Though scarcely a third of the

original edifice remains, it is by far the most imposing monument of antiquity that the Imperial City has to show.

THE PANTHEON is the most perfect of the ancient buildings in Rome. It was built B. C. 27 by M. Agrippa, and restored by Septimius Severus and Caracalla about A. D. 202, and has suffered much since. The vast round walls of brick, twenty feet thick, were once covered with marble. The portico (now below, but once above, the square) has sixteen huge monolithic columns of Oriental granite, thirty-nine feet high, with Corinthian capitals of famed beauty. Statues of Augustus and Agrippa once stood here. The circular interior is very impressive, and is lighted from a place twenty-eight feet across in the center of the dome, open to the sky.

This unrivalled dome is one hundred and forty feet high and one hundred and forty feet across. The gilded bronze roof-tiles were carried to Constantinople in 655; and all the other bronzes were used in making cannon for the citadel and the canopy in St. Peter's. The seven niches in which statues of the gods stood are now occupied by altars. Raphael is buried here, near his betrothed, Cardinal Bibiena's niece; and here is the tomb of King Victor Emmanuel of Italy.

THE CAPITOL, which is one hundred and sixty feet above the sea level and is best approached by the grand staircase known as La Cordonnata. At its foot are two lions of Egyptian porphyry; at its head the ancient colossal statues of Castor and Pollux. Beyond these on either side are the sculptures misnamed "the Trophies of Marius" and the statues of Constantine and his son from the Baths of Constantine on the Quirinal. The open space here is the Piazza del Campidoglio, the ancient Intermontium, where Brutus harangued the people after the murder of Cæsar. In the center is the celebrated statue of Marcus Aurelius, "the only perfect ancient equestrian statue in existence." It owes its preservation to the fact that it was long supposed to be a statue of Constantine. On the right is the Palace of the Conservatori, on the left the Museum of the Capitol, both designed by Michaelangelo; between the two, occupying the third side of the square, is the Palace of the Senator, on the site of the ancient Tabularium. The fountain at the foot of the stairs is adorned with statues of river-gods, the Tiber and the Nile. The tower contains the great bell which is rung only to announce the opening of the carnival or the death of a pope.

THE CAPITOLINE MUSEUM contains some of the most famous sculptures extant, as the Dying Gladiator, the Venus of the Capitol, the Faun of Praxiteles, the Antinous, etc. There is also the rich collection of busts and statues of Roman emperors and empresses, statesmen, philosophers, etc., "perhaps the most interesting portrait gallery in the world."

VILLA UMBERTO PRIMO (FORMERLY VILLA BORGHESE), ROME

Has art collections considered only second in importance to that of the Vatican, and, despite the removal of many works, the number of really great paintings retains for the collection its old pre-eminence.

Famous Churches.—Ancient Rome contained about three hundred temples, and modern Rome has about as many churches, eighty of which are dedicated to the Virgin. St. Peter's, St. John Lateran, S. Maria Maggiore on the top of the Esquiline, S. Paolo fuori le Mura ("outside the walls"), perhaps the most gorgeously decorated church in Rome, and S. Lorenzo fuori le Mura are the five Patriarchal churches, to one or other of which all believers throughout the world are supposed to belong. With Santa Croce in Gerusalemme and S. Sebastiano, they make up the famous "Seven Churches of Rome" frequented by pilgrims. They are also unsurpassed in their rich architectual and art interests.

THE MAGNIFICENT VILLA MEDICI, ROME

St. Peter's, adjoining the Vatican, perhaps the most famous and certainly the largest church in the world, has an area nearly twice that of St. Paul's in London, while its dome rises to the height of four hundred and three feet.

Many architects were concerned in the building of the Cathedral of St. Peter, but the principal credit is assigned to Bramante, the creator of the design, and to Michaelangelo, whose chief work is the dome. To the spectator, approaching from the Piazza di San Pietro, the majesty of the dome is lost behind the façade, erected at the instance of Pope Paul V. at the end of the nave lengthened by him in order to work out the idea of a Latin cross; the design of Bramante was a Greek cross.

CHURCH OF ST. JOHN LATERAN, ROME, THE MOTHER CHURCH OF CHRISTENDOM

The building was commenced in 1506, but was not completed until 1626; the total cost of erection was about fifty million dollars, and its maintenance absorbs annually about forty thousand dollars.

It covers about eighteen thousand square yards; the length is two hundred and thirty-two yards, of the transept one hundred and fifty yards; height of the nave one hundred and fifty-one feet; height of the dome from the pavement to the summit of the lantern four hundred and four feet; to the summit of the cross four hundred and thirty-four feet.

Besides the high altar there are twenty-nine other altars; the high altar being immediately over the Tomb of St. Peter. Round the Confessio are ninety-five lamps, always lighted. The bronze statue of St. Peter, on white marble, under a canopy, is by a pillar; the right foot of which is worn smooth by the kisses of worshipers.

St. John Lateran. (It. *San Giovanni in Laterano*), adjoining the papal palace of the Lateran, claims to be the mother-church of all Christendom. It was originally named from the Roman family Lateranus. Beside it are its ancient Baptistery and a building enclosing the Scala Santa, brought from Pilate's palace in Jerusalem in 326.

Many other of the Roman churches contain treasures of art or are interesting for their structure or history. S. Maria Sopra Minerva is the only ancient Gothic church in the city. S. Pietro in Vincoli contains Michaelangelo's famous statue of Moses; and S. Maria delle Pace Raphael's beautiful frescoes of the Sibyls. The Gesù is the chief church of the Jesuits. San Carlo al Corso is the fashionable church.

Roads.—The roads leading out of Rome beyond the Servian Walls were bordered by tombs, many of which, on the erection of the Aurelian Wall, were included within the city. The most famous of these celebrated roads was the:

Appian Way (called Regina Viarum) was begun B. C. 312 by Appius Claudius, and ran to Capua, and afterwards to Brindisi, forming main route to southern Italy, Greece and Egypt. There are beautiful views all along, of Campagna, aqueducts, and Alban Mountains.

On Via Appia are Catacombs of S. Calixtus, with tombs of St. Cecilia and many second and third century popes and martyrs, and seventh-century Byzantine paintings. A quarter of a mile beyond is very ancient S. Sebastiano Church under which are extensive catacombs. On a hill still beyond stands the famous Tomb of Cœcilia Metella, round, sixty-five feet in diameter, and in thirteenth century a tower of now vanished castle of the Gaetani. Beyond, the Way is bordered by ancient tombs on either side, and the old Latin pavement is the road-bed.

At Trivoli is Hadrian's Villa (Villa Adriana) an extensive ruin, with the gardens covering about 170 acres.

APPIAN WAY

A famous Roman military road, the skill with which it is taken through difficult country, over hills, ravines, and marshes, is remarkable. Horace, in his first satire, describes a journey along it, and St. Paul came this way into Rome (Acts xxviii. 15).

POPE PIUS X. IN THE BED IN WHICH HE DIED
(Picture by Cav. G. Felici)

PROCLAMATION OF POPE BENEDICT XV. (Cardinal della Chiesa) **IN FRONT OF ST. PETER'S, ROME**
(From a Painting)

Florence (Lat. *Florentia* Ital. *Firenze*), one of the most famous of Italian cities, is situated fifty miles from the sea, in the valley of the Arno, and is built on both sides of the river, but chiefly on the north. The outlying suburbs are singularly beautiful, and are surrounded by finely wooded hills, bright with gay villas and charming gardens. The old city itself is characterized by a somber grandness, and is full of fine buildings of historic and artistic interest.

The chief building in the city is the Duomo, or Cathedral, the foundations of which were laid with great solemnity in 1298; but not until 1887 was the completed façade uncovered. The church

contains sculptures by Ghiberti, Luca della Robbia, Michælangelo, Sansovino, Bandinelli, and other famous artists.

At the side of the cathedral springs up the light and elegant Campanile, detached, according to the custom of the times. In front is the Baptistery in the form of an octagon, supporting a cupola and lantern. Three bronze gates in basso rilievo are a great additional adornment of the Baptistery; the two by Ghiberti have been immortalized by Michælangelo, with the name of Gates of Paradise.

The church of the Santa Croce, the Pantheon of Florence (built in 1294), contains monuments to Galileo, Dante, Macchiavelli, Michælangelo, Alfieri and others.

Among the numerous palaces Il Bargello, long a prison, but now restored and opened as a national museum, is one of the most ancient.

The Palazzo Vecchio, the seat of the republican government from its establishment till its abolition in 1530, is an imposing mass of building. Adjoining the palace is the Piazza della Signoria, a square containing a fine collection of statues, and a noble arcade, the Loggia dei Lanzi.

The Uffizi Palace is a handsome building adjoining the Palazzo Vecchio, founded by Cosmo I. On the second floor is contained the famous Florentine gallery of art. A splendid apartment, known as the Tribuna, contains the rarest treasures of the collection.

The Pitti Palace, formerly the grand-ducal residence, boasts of a superb gallery of paintings. Behind it are the beautiful Boboli Gardens royal. The Strozzi Palace is a fine type of Tuscan architecture.

Florence is the city of Dante, Petrarch, Michaelangelo, Leonardo da Vinci, Boccaccio, Machiavelli, Galileo and many more of Italy's great men, and has a history of exceptional interest. It is an educational center, and carries on a trade in straw-plaiting and silk, sculptures, jewelry, and exquisite mosaics in rare stones.

Genoa (Ital. *Genova*), is situated on the Mediterranean gulf of the same name, at the foot of the Apennines, and is an important seaport. By rail it is eight hundred and one miles southeast of Paris, one hundred and seventy-one miles northeast of Marseilles, and ninety-three miles southwest of Milan. The slopes of the hills behind the city down to the shore are covered with buildings, terraced gardens, and orange and pomegranate groves; while the bleak summits of the loftier ranges, rising still farther back, are capped with strong forts, batteries, and outworks.

While strikingly grand as viewed from the sea, and so far worthy of being entitled "Genoa the Superb," is in reality built awkwardly on irregular rising ground, and consists of a labyrinth of narrow and intricate lanes. Of the palaces the most famous are the former palace of the doges, now the meeting-place of the senate; and the Doria, presented in 1529 to the great Genoese citizen Andrea Doria. Foremost among the churches stands the Cathedral, a grand twelfth-century pile in the Italian Gothic style. The marble Municipal Palace and the palace of the Dogana must also be mentioned.

To Columbus and Mazzini, Genoa's most famous sons, there are fine monuments.

It is the commercial outlet for a wide extent of country, of which the chief exports are rice, wine, olive-oil, silk goods, coral, paper, macaroni and marble. The principal industrial establishments of the city embrace ironworks, cotton and cloth mills, macaroni-works, tanneries, sugar-refineries, and vesta-match, filigree, and paper factories. Genoa benefited greatly by the opening of the St. Gothard Railway.

Milan (*me-lan'*, *mil'an*. Ital. *Milano*, *mee-lah'no*), the capital of Lombardy, is one of the largest and wealthiest cities of Italy. It was an important town under the Romans, was sacked by Attila in 452, totally destroyed by Frederic Barbarossa in 1162, and has figured prominently in more recent history.

The city, nearly circular in shape, is surrounded on three sides by walls, has a circuit of nearly eight miles, and is entered by fourteen gates.

Of the numerous churches the magnificent Gothic Cathedral is the most famous. It is second only to St. Peter's and Seville Cathedrals in size and was built principally during the period 1386-1500. After many delays and interruptions, work was resumed under Napoleon I. in 1805, but is not yet fully completed. The façade has recently been restored. It is cruciform, with double aisles and transept-aisles, separated by fifty-two pillars, each twelve feet in diameter, with niches crowded with statues. Interior four hundred and seventy-seven feet long, one hundred and eighty-three feet wide and one hundred and fifty-five feet high. It contains six thousand statues, a pavement of marble mosaic, vast granite monoliths, superb stained windows, many tombs of magnates, St. Carlo Borromeo's wooden crucifix and gorgeous tomb, and life-size silver statues of saints. The wonderful marble roof is studded with ninety-eight Gothic turrets, hundreds of pinnacles, and over two thousand life-size marble statues.

Of the other churches S. Maria delle Grazie (fifteenth century), partly the work of Bremante, was originally an abbey church, and the refectory in the rear contains Leonardo da Vinci's celebrated fresco of the Last Supper, which, in 1909, was successfully restored.

The Brera Palace (twelfth century), formerly a Jesuit college, has now a great gallery of paintings by Raphael, Da Vinci, Luini, Mantegna, the Bellinis, Titian, Vandyck, and others, an academy of art, a collection of casts, the magnificent monument of Gaston de Foix, the National Library, an archaeological museum, and an observatory.

The colonnade of Victor Emmanuel Gallery is the finest arcade in the world, and was built in 1865-1867 at a cost of one million six hundred thousand dollars. It is nine hundred and sixty feet long, forty-eight feet wide, ninety-four feet high, surrounded by handsome shops, richly frescoed, and adorned with statues of Raphael, Galileo, Dante, Cavour, and twenty other famous Italians. The octagon under the dome (one hundred and eighty feet high) is brilliantly lighted at night, when it forms a favorite promenade

On the adjacent Piazza della Scala is Leonardo da Vinci's monument, and the massive Municipal Palace. The Arch of Peace, built of white marble, commemorates the exploits of Napoleon. The Della Scala Opera House is the second in size (after San Carlo at Naples) in Italy; and the Milan conservatoire is the most famous school of music in Europe.

Beccaria, Manzoni, the popes Pius IV. and Gregory XIV. were natives of Milan. The city now carries on a vast trade, much increased since the opening of the Gothard railroad, in raw silk, cotton, grain, rice, and cheese, and manufactures silks, velvets, gold, silver, and iron wares, railroad carriages, tobacco, porcelain, electrical apparatus, and is an active center of the printing trade.

Naples (Ital. Napoli *nä'pō-lē'*).—The capital of the province of Naples has a lovely situation within the bend of Naples Bay, spreading from the foreshore back upon wooded hills and rising terraces, behind which lie the snow-clad Apennines. To the east lies the old town with its historic Via di Roma and narrow crowded thoroughfares; the newer portion to the west is more spaciously laid out, and much has been done in recent years over the whole city to improve the sanitation and water supply. The

National Museum, rich in Pompeii relics, the University, the National Library, the Cathedral and the four mediæeval gateways are the chief architectural features.

Large quantities of wine, olive-oil, chemicals, perfumery, etc., are exported, while woolen, silk, linen, glove and other factories carry on a good home trade.

Naples became incorporated in the kingdom of Italy in 1861 after the Bourbon dynasty had been swept away by Garibaldi.

RUINS OF POMPEII, ITALY

POMPEII (pron. *Pom-pay'yee*), once a Greek seaport at the mouth of the Sarnus, is fifteen miles south of Naples; it fell into the possession of Rome about 80 B. C., and was converted into a watering-place, "the pleasure haunt of paganism." The Romans erected many handsome public buildings, and their villas and theaters and baths were models of classic architecture and the scenes of unbounded luxury. The streets were narrow, provided with sidewalks, the walls often decorated with paintings, and the number of shops witnesses to the fashion and gaiety of the town. A terrible earthquake ruined it and drove out the inhabitants in A. D. 63; they returned and rebuilt it, however, in a tawdry and decadent style, and luxury and pleasure reigned as before till in A. D. 79 an eruption of Vesuvius buried everything in lava and ashes. The ruins were forgotten till accidentally discovered in 1748; since 1860 the city has been disinterred under the auspices of the Italian Government, and is now a favorite resort of tourists and archæologists.

HERCULANEUM, so called from the local worship of Hercules, was situated at the northwestern base of Mount Vesuvius, five miles east of Naples. In 63 A. D. it was seriously injured by a violent earthquake, and, in 79 A. D, buried, along with Pompeii and Stabiæ, by the memorable eruption of Vesuvius. In 1738 systematic excavations were commenced, the chief building explored being the theater, which has eighteen rows of stone seats, and could accommodate eight thousand persons; part of the Forum with a colonnade, two small temples, and a villa have also been discovered, and from these buildings many beautiful statues and remarkable paintings have been obtained. In 1880 ruins of extensive baths were brought to light. Among the art-relics of Herculaneum, which far exceed in value and interest those found at Pompeii, are the statues of Eschines, Agrippina, the Sleeping Faun, the Six Actresses,

BEAUTIFUL SORRENTO, ITALY

Mercury, the group of the Satyr and the Goat, the busts of Plato, Scipio Africanus, Augustus, Seneca and Demosthenes—mostly now in the National Museum at Naples.

Palermo (*pä-ler'mō*), capital of the province of Palermo, Sicily, a seaport on the Bay of Palermo, at the foot of Monte Pellegrino, is picturesquely situated in the midst of a beautiful and fertile valley called the Golden Shell. It is a handsome town, with many public buildings and nearly three hundred churches in Moorish and Byzantine architecture, a university, art school, museum, and libraries.

The industries are unimportant, but a busy trade is done with Britain, France and the United States, exporting fruits, wine, sulphur, etc., and importing textiles, coal, machinery and grain.

Sorrento (*sōr-ren'tō*), a town in the province of Naples, beautifully situated on the Bay of Naples, sixteen miles south-southeast of Naples, is a favorite watering-place; was noted in antiquity for its wines; and was the birthplace of Tasso.

Turin, (Ital. Torino *tō-re'nō*).—Capital of the province of Turin, Italy, is situated on the Po, near its junction with the Dora Riparia. It is regularly built, with many squares and broad streets; is the seat of important trade for northern Italy; has varied manufactures; and is rapidly growing. It contains a university, cathedral, castle (Palazzo Madama), royal palace (with the royal armory and library), Palazzo Carignano (former seat of Parliament, now containing collections in natural history), palace of the Academy of Sciences (with a museum of antiquities and picture-gallery), monument of Cavour, etc. Victor Emmanuel and Cavour were born there.

VIEW OF THE CAMPANILE AND PALACE, VENICE, FROM THE GRAND CANAL

VISTA ON THE GRAND CANAL, VENICE

ST. MARK'S CATHEDRAL AND CAMPANILE FROM THE PLAZA

Turin was the ancient capital of the Taurini (whence the name); was captured by Hannibal in 218 B. C.; and has played an important part in the history of Europe. It figured prominently in the national movements of the nineteenth century, and was the capital of the kingdom of Italy 1859-1865.

Venice (*ven'is* Ital. *Venezia*), capital of the province of Venice, is situated in the Laguns (lagoons) in a bay of the Adriatic. Now Venice covers more than seventy-two islets, or rather mud-banks, its foundations being piles ("time-petrified") and stone. Through its two unequal portions winds for over two miles the Grand Canal, spanned by the Rialto Bridge (of stone) and two others (of iron), and into it flow one hundred and forty-six lesser canals, all bridged at frequent intervals. This vast network of waterway is patrolled by countless gondolas, while the pedestrian has his choice of innumerable lanes (calli). A railway viaduct, two and one-eighth miles long, connects Venice with the mainland.

The Piazza di San Marco, a square five hundred and seventy-six feet long and one hundred and eighty-five to two hundred and seventy feet wide

paved with gray trachyte and white Istrian marble, surrounded by time-stained marble palaces and St. Mark's Church is the picturesque center of Venetian life, especially at evening, when the bands play, and the cafés are crowded by thousands. Flocks of fat pigeons have been fed here by the city daily for seven hundred years. Palaces enclose three sides and the palace arcades are occupied by cafés and bric-a-bràc shops.

Of its public buildings the following are the principal: the Ducal Palace, standing on the site of a former official residence of the Doges, which was burned in 976. Besides its painted ceilings and walls there are many pictures by the Italian masters; the Academy of Fine Arts whose twenty rooms are filled with some of the finest works of the Old Masters. Its principal churches are St. Marco, St. Giorgio Maggiore, and Sta. Maria della Salute, are all most highly decorated with frescoes, mosaics, and carvings, besides containing many world-famed pictures. The Campanile of St. Marco has been rebuilt since its fall, on July 14, 1902, after standing a thousand years. The palaces of the nobility on the Grand Canal and other canals contain priceless collections of pictures. The Arsenal contains many models of the old Venetian ships, armor, collections of weapons, and spoils of war.

Venice was noted for its textile manufactures as early as the fifteenth century; the principal manufactures at the present time are tapestry, brocades, Venetian laces, wood carving, artistic wrought-iron work, jewelry, bronzes, machinery. and clocks, and at Murano glass and glass beads.

Italian Seaports.—The chief seaports of Italy after Genoa, "the Superb," which is the busiest of all, are in order round the coast—Livorno, or Leghorn, the port of Tuscany and Florence; Civita Vecchia, the port of Latium; Naples, with Castellamare on the south side of its bay; Messina, on the Sicilian side of the Strait named after it, with one of the finest harbors in Europe, beside the eddy which was feared as the whirlpool of Charybdis in ancient times; Palermo, "la Felice," in the vale of the Golden Shell, on the north coast of Sicily; Catania, on the east coast of the island. Coming round to the Adriatic coasts we reach the port of Brindisi, a notable point in the most direct route from western Europe to Egypt and the East. The most important line of railway in Italy, that leads from the plain of Lombardy all down the east side of the peninsula, has the port of Brindisi as its objective point. Farther north we come to Venice, the city of canals and bridges, described above; and Trieste, acquired from Austria-Hungary, in 1919, by the Treaty of Versailles.

HISTORY OF ITALY

The ancient history of Italy will be found under Rome. The modern history begins with 476 A. D., when Odoacer, chief of the Herulians, a German tribe who had invaded the country, was proclaimed king of Italy. After a reign of twelve years he and his followers were overpowered by the Ostrogoths under Theodoric the Great. The Ostrogoths were in turn subdued by Byzantine troops, and Italy came under the dominion of the Eastern emperors, who ruled through an exarch residing at Ravenna.

The Lombards.—In 568 the Lombards (Langobardi), a German people originally from the Elbe, led by their king, Alboin, conquered the Po basin, and founded a kingdom which had its capital at Pavia. The kingdom of the Lombards included Upper Italy, Tuscany and Umbria, with some outlying districts. But on the northeast coast, the inhabitants of the lagoons still retained their independence, and in 697 elected their first doge, and founded the republic of Venice.

Ravenna, the seat of the exarch, with Romagna, Rimini, Ancona, and other maritime cities on the Adriatic, and almost all the coasts of Lower Italy, remained unconquered, together with Sicily and Rome. The slight dependence of this part of Italy on the court of Byzantium disappeared almost entirely in the beginning of the eighth century.

Rise of Papal Power.—The power of the pope, though at first recognized only as a kind of paternal authority of the bishop, grew steadily in these troubled times, especially in the struggle against the Lombard kings. In consideration of the aid expected against King Astolphus, Pope Stephen III. (754) not only anointed the king of the Franks, Pepin, but appointed him patrician or governor of Rome. In return Pepin presented the exarchate of Ravenna, with the five maritime cities, to the pope, thus laying the foundation of the temporal power of the Holy See. At the invitation of Pope Hadrain I. Charlemagne made war upon Desiderius, the king of the Lombards, took him prisoner in his capital, Pavia (774), and united his empire with the Frankish monarchy. Italy, with the exception of the duchy of Benevento and the republics of Lower Italy, thus became a constituent part of the Frankish monarchy, and the imperial crown of the West was bestowed on Charlemagne (800).

Port of the Holy Roman Empire.—On the breaking up of the Carlovingian empire, Italy became a separate kingdom, and the scene of strife between Teutonic invaders. At length Otto the Great was crowned emperor at Rome (961), and the year after became emperor of what was henceforth known as the Holy Roman Empire.

During the following centuries the towns and districts of North and Middle Italy gradually made themselves independent of the empire, and either formed themselves into separate republics or fell under the power of princes bearing various titles. A large part of Middle Italy at the same time was under the dominion of the popes, including the territory granted by Pepin, which was afterwards enlarged on several occasions.

Vicissitudes of Southern Italy.—In southern Italy there were in the time of Charlemagne several independent states. In the ninth century this part of the peninsula, as well as Sicily, was overrun by Saracens, and in the eleventh century by Normans, who ultimately founded a kingdom which embraced both Lower Italy and Sicily, and which though it more than once changed masters, continued to exist as an undivided kingdom till 1282. In that year Sicily freed herself from the oppression of the then rulers, the French, by the aid of Pedro of Aragon, and remained separate till 1435. It was again separate from 1458 to 1504, when both divisions were united with the crown of Spain. With Spain the kingdom remained till 1713, when Naples and Sicily were divided by the Treaty of Utrecht, the former being given to Austria, the latter to the Duke of Savoy. In 1720 they were again

united under Austria, but in 1734 were conquered from Austria and passed under the dominion of a separate dynasty belonging to the Spanish house of Bourbon.

Mediæval Italy.—The history of mediæval Italy is much taken up with the party quarrels of the Guelfs and Ghibellines, and the quarrels and rivalries of the free republics of Middle and Upper Italy. In Tuscany the party of the Guelfs formed themselves into a league for the maintenance of the national freedom under the leadership of Florence; only Pisa and Arezzo remained attached to the Ghibelline cause. In Lombardy it was different, Milan, Novara, Lodi, Vercelli, Asti, and Cremona formed a Guelf confederacy, while the Ghibelline league comprised Verona, Mantua Treviso, Parma, Placenza, Reggio, Modena, and Brescia. Commercial rivalry impelled the maritime republics to mutual wars. At Meloria the Genoese annihilated (1284) the navy of the Pisans, and completed their dominion of the sea by a victory over the Venetians at Curzola (1298.)

Influences of Napoleon.—Up till the time of the Napoleonic wars Italy remained subject to foreign domination, or split up into separate republics and principalities. The different states were bandied to and fro by the changes and intrigues of war and diplomacy between Austria, Spain and the House of Savoy. During the career of Napoleon numerous changes took place in the map of Italy, and according to an act of the Congress of Vienna in 1815 the country was parcelled out among the following states:—(1) The Kingdom of Sardinia, consisting of the island of Sardinia, Savoy, and Piedmont, to which the Genoese territory was now added. (2) Austria, which received the provinces of Lombardy and Venetia, these having already been acquired by her either before or during the time of Napoleon. (3) The Duchy of Modena. (4) The Duchy of Parma. (5) The Grandduchy of Tuscany. (6) The Duchy of Lucca. (7) The States of the Church. (8) The Kingdom of the Two Sicilies. (9) The Republic of San Marino. (10) The Principality of Monaco.

Struggle for Independent Nationality.—The desire for union and independence had long existed in the hearts of the Italian people, and the governments at Naples, Rome, Lombardy, and other centers of tyranny were in continual conflict with secret political societies. The leading spirit in these agitations in the second quarter was Giuseppe Mazzini.

The year of revolutions, 1848, opened with a street massacre by the Austrians in Milan, on January 2. In February, 1849, the French Republic was declared, and then in Italy the party of Mazzini was for a moment supreme, when Charles Albert abdicated in favor of his son Victor Emmanuel. Meanwhile the pope had been driven from Rome, and a Roman republic had been established under Mazzini and Garibaldi, the leader of the volunteer bands of Italian patriots. Rome was, however, captured by the French, who came to the aid of the pope (July, 1849), who resumed his power in April, 1850, under the protection of the French, and the old absolutism was restored. Similar attempts at revolution in Sicily and Naples were also crushed, but the secret societies of the patriots continued their operations.

Establishment of the Present Kingdom.—In 1859, after the war of the French and Sardinians against Austria, the latter power was compelled to cede Lombardy to Sardinia, and in the same year Romagna, Modena, Parma, and Piacenza were annexed to that kingdom, which was, however, obliged to cede the provinces of Savoy and Nice to France. In the south the Sicilians revolted, and supported by a thousand volunteers, with whom Garibaldi sailed from Genoa to their aid, overthrew the Bourbon government in Sicily. Garibaldi was proclaimed dictator in the name of Victor Emmanuel. In August Garibaldi crossed to Naples, defeated the royal army there, drove Francis II. to Gaeta, and entered the capital on the 7th September. Sardinia intervened and completed the revolution, when Garibaldi, handing over his conquests to the royal troops, retired to Caprera. A plebiscite confirmed the union with Piedmont, and Victor Emmanuel was proclaimed king of Italy, thus suddenly united almost in Mazzini's phrase, "from the Alps to the sea."

Only Venice and the Papal State now remained to be joined to the new kingdom. To obtain Venice, Italy joined Prussia in her war against Austria in 1866; and though the Italians were beaten on land at Custozza and on sea at Lissa, the triumph of Prussia was so complete that, by the peace of Prague, Venice was surrendered to Italy.

Conquest of the Papal States.—Rome was less easy to secure, because of the opposition of Roman Catholic opinion throughout Europe. French soldiers had protected the pope ever since 1849. In 1862 Garibaldi prepared to make a dash on the Papal States, but the government felt obliged to stop him. He was surrounded on Mount Aspromonte and taken prisoner. The withdrawal of the French troops from Rome (1864) was only procured by a promise to respect the Papal States, and by the transference of the capital from Turin to Florence.

In spite of the prohibition of the government, Garibaldi made another attempt on Rome in 1867; but Napoleon sent more French troops, and Garibaldi was defeated at Mentana, and had to withdraw. It was not till the fall of the French Empire in 1871 that the Italian government could act freely. As Pius IX. refused to give up the temporal power, the Italian government took the capital by force, and Pius withdrew to the Vatican, where he remained in voluntary confinement, a course followed by his successor, Leo XIII. (1878-1903), and by the present Pope, Pius X.

Difficulties of Consolidation.—The consolidation of Italy, since the formation of the kingdom, has been slow and difficult owing to the great social differences between northern and southern Italy. The nation, too, has been ambitious to be recognized as one of the great powers of Europe, which involves a vast outlay in expenditure.

In 1878 Victor Emmanuel died, and was succeeded by Humbert I.; Pius IX. being succeeded by Leo XIII. in the same year. Hum-

MONUMENT TO VICTOR EMMANUEL II., AT ROME. THIS MEMORIAL IS EMBLEMATIC OF ITALIAN UNITY AND WAS ERECTED AT AN EXPENDITURE OF $10,000,000.—THE COSTLIEST MEMORIAL IN THE WORLD. AND POSSIBLY THE MOST MAGNIFICENT

bert's reign was marked by electoral reform and foreign colonization. Somaliland, along the northeast coast of Africa, was acquired between 1880 and 1890, and the dependency of Eritrea was founded in 1882. Italy's claims to a protectorate over Abyssinia led to war, which ended in an Italian defeat at Adowa, 1896, and the restoration of all land to Abyssinia by the treaty of Adis Abeba.

In 1883 Italy entered the Triple Alliance with Germany and Austria, largely owing to her distrust of France. In 1900 King Humbert was assassinated by an anarchist, and was succeeded by his only son, Victor Emmanuel III. At the beginning of the new century more friendly relations were secured with France, the Triple Alliance being still maintained.

In the recent dissensions in Morocco (1906-1911) the government gave its support to France against Germany, while France acquiesced in Italian ambitions in Tripoli.

In September, 1911, war broke out between Italy and Turkey in connection with the rights and privileges of Italian subjects in Tripoli. In November of the same year the Italian government formally proclaimed the annexation of Tripoli and Cyrenaica, which was ratified by Turkey in the treaty of Ouchy in October, 1912. In the Balkan war (1912-1913) Italy's sympathies were naturally with the allies against her recent enemies; the royal family, moreover, is connected with that of Montenegro, Queen Elena of Italy being the daughter of King Nicholas of Montenegro.

In May, 1915, Italy renounced the Triple Alliance and entered the European war on the side of Great Britain and France. War was declared upon Austria-Hungary, and Italian forces dispatched to the Trentino. No formal declaration of war was made against Germany until Aug. 27, 1916. Subsequently, Italy requisitioned the German steamers interned in Italian ports.

By the Treaty of Versailles, in 1919, Italy acquired the Trentino and Trieste from Austria-Hungary.

Books of Reference.—Gregorovius's *History of the City of Rome in the Middle Ages;* Sismondi's *History of the Italian Republics;* Symonds' *Age of the Despots;* Burckhardt's *Civilization of the Renaissance in Italy;* Creighton's *History of the Papacy During the Reformation;* Ranke's *History of the Popes* and his *Latin and Teutonic Nations;* King's *A History of Italian Unity;* Stillman's *The Union of Italy;* Orsi's *Modern Italy.*

AUSTRIA

The name Austria, is a Latinized form of the German *Oesterreich*, meaning "Eastern Kingdom."

Austria belongs to the Germanic group of European states, and, as at present constituted by the Treaty of Versailles, in 1919, embraces about one-sixth of the area and one-fifth of the population of the former-Austro-Hungarian Empire.

By this Treaty the lands of the Empire were distributed among the newly created states of Austria, Poland, Hungary, Czecho-Slovakia, and Jugoslavia, with certain recessions to Italy and Roumania. The exact boundaries of these states, involving many problems of race, defense, and commercial outlet, will necessarily be delayed for a period of years. The present article deals, therefore, with the former Austro-Hungarian Empire as a geographical whole.

Location and Extent.—The Austrian dominions form geographically a compact territory, with a circumference of about five thousand three hundred and fifty miles. The total area is greater than that of any other European state save Russia, and is nearly twice the area of Great Britain. The body of the empire lies in the interior of Europe, though it has about one thousand miles of sea-coast on the Adriatic. Austria borders on Italy, Switzerland, Bavaria, Saxony, Prussia, Russia, Roumania, Servia and Montenegro. With the sanction of the Berlin Congress of 1878, the small territory of Spizza, on the Montenegrin frontier and formerly Turkish, was incorporated with Dalmatia. The Turkish provinces of Bosnia and Herzegovina, were annexed by proclamation in 1908.

Surface Features.—Austria-Hungary has been termed the "Empire of the Danube," since it lies for the most part within the basin of that river, and embraces the whole of its upper plain, which lies at an elevation of about three hundred feet above the sea. But it is also, next to Switzerland, by far the most mountainous land in Europe, no less than four-fifths of its area being more than six thousand feet above the sea-level.

On the west, Austria embraces nearly half of the great mass of the Alps between the plateau of Bavaria and the plain of Lombardy, the mountain and valley scenery of Tyrol and Salzburg resembling that of Switzerland on a lesser scale. The highest point of all here is the Ortler Spitze. An eastern spur of these heights, the Bakony Wäld, runs into Hungary, compelling the Danube to form a sharp east-to-south bend or knee in its course. In the northwest the Bohmer Wäld, the Erz, and Riesen Gebirge, the Sudetic Mountains, and the Moravian heights, enclose the high basin of the Upper Elbe in Bohemia. Farther east the wooded Carpathians, with the high outlying granite mass of the Tatra rise round the north of the Hungarian plain. These are continued by the Transylvanian Alps, which form the southeastern frontier, next Roumania, and which, with their northern branch, the Biharia Mountains, enclose the highland of Transylvania or Siebenbürgen.

Rivers and Lakes.—The Danube, entering Austria from Bavaria as a considerable river, and flowing southeastward over the plain of Hungary, grows to more than half a mile in width before it leaves the Hungarian border to descend by the gorge of the Iron Gates into its lower plains. It is the great highway of the kingdom, and the great outlet to the Black Sea on the east. (See further under Danube.)

The Save, the southern boundary river of Hungary, and the Drave join the Danube in the south from the Eastern Alps, up to the base of which both are navigable.

The Theiss, winding south through the plain of Hungary from its source in the Carpathians, is its great northern tributary, also navigable, and so full of fish as to be popularly described as "two-thirds water and one-third fish."

The March, from the Sudetic Mountains, corresponds to the Leitha from the south, forming part of the boundary between Austria and Hungary. The high basin of Bohemia, as before said, forms the upper basin of the Elbe, which escapes thence into Saxony.

The head stream of the Oder passes through Austrian Silesia; and the Vistula, draining like these to the Baltic, has its head streams in the northern slopes of the Carpathians in Galicia, the eastern portion of which province, however, drains to the Black Sea by the Dniester.

Lakes.—The two large lake basins of the country, which seem to be remnants of much more extensive inland waters, lie in Hungary between the Danube and the Drave. The larger, the Platten See or Balaton Lake, fifty miles long, shallow and stagnant, overflows into the surrounding marshes only in spring. The Lake of Constance, on the northern margin of the Alps, and Lake Garda, on the southern, touch upon Austrian territory.

Climate and Landscape.—Though from the variations of elevation the climates of different parts of Austria-Hungary are very diverse, three broad divisions may be recognized — (1) the climate of the countries which lie north of the Carpathian heights, in which the winters are long and cold, and in which the vine does not flourish; (2) that of the central plains and slopes of Hungary, favorable to wheat and vines; and (3) the Mediterranean climate of the Adriatic shores, which yield oil and silk.

Generally speaking, all the mountainous borders of Austria-Hungary are forest-covered, the woods occupying a third of the whole surface of those regions; the great plain of Hungary, on the other hand, is an open, treeless steppe.

Peoples and Races.—Austria-Hungary extends over the area in which many different races of Europe meet and interlace. Its population includes Germanic, Slavonic, Magyar, and Romanic elements, with their various tongues and dialects. The Germanic prevails in the Alpine regions and in the valley of the Danube in the west, and is widely mingled with the Slavonic and Magyar in the northern and central parts of the country.

The Slavs, the most numerous branch, forming about forty-five per cent of the whole population, appear in two divisions, a northern and southern; to the northern Slavs belong the Czechs of Bohemia, the Moravians and Slovaks, Poles and Ruthenians, or Russniaks of Galicia and Bukowina; to the southern Slavs belong the Slovenes, Croats and Servians, who occupy the southern border lands of Hungary, between the Drave and Save, westward to the peninsula of Istria and the Dalmatian coasts of the Adriatic. The Romanic element appears in the southeast on the Danube frontier, in southern Transylvania and eastern Bukowina (Wallachians), and in the southwest, where the Italians prevail in numbers on the borders of Venetia. The Magyars occupy the central plains of Hungary. The Szeklers of eastern Transylvania are a branch of the same family, by some believed to be the descendants of the once formidable Huns. Among minor elements of population, Jews are numerous in the northern provinces, Gypsies in Hungary, and Armenians in Transylvania and Galicia.

Religion and Education.—The state religion is the Roman Catholic, and this is professed by two-thirds of the population; a large proportion on the eastern borders next to Russia adhere to the Greek Church; Protestants are most numerous in Hungary and Transylvania, but form only a tenth part. General education, excepting in German Austria, where the compulsory system is enforced, is in a very backward state. There are, however, eleven universities in Austria-Hungary: Vienna, Prague (two), Budapest, Graz, Innsbruck, Cracow, Lemberg, Czernowitz, Klausenburg, and Agram.

Industries and National Resources.—The occupations of the country naturally divide themselves between the mining and pastoral industries of the mountains, and the agricultural and pastoral of the plains.

Agriculture employs by far the largest share of the population; and the lower lands of Austria-Hungary are among the most fertile portions of Europe. Oats, rye, barley, wheat, and maize, are the commonest grains; flax and hemp are widely grown; wines and tobacco chiefly in Hungary; hops in Bohemia.

Horticulture is carried to great perfection; and the orchards of Bohemia, Austria proper, Tyrol, and many parts of Hungary produce a profusion of fruit. Great quantities of cider are made in Upper Austria and Carinthia, and of plum-brandy in Slavonia. In Dalmatia, oranges, lemons and a few olives are produced.

In the production of wine, Austria is second only to France. With the exception of Galicia, Silesia, and Upper Austria, the vine is cultivated in all the provinces; but Hungary stands first, yielding not only the finest quality of wine, but four-fifths the total amount produced in the empire.

Animal Products.—The central Hungarian steppes are full of cattle, and those of the Alpine regions are an exceedingly fine breed. Merino sheep are carefully reared, especially in Moravia, Bohemia and Hungary. The river fisheries are important all over the land. The coast fisheries are of the utmost importance in rocky Dalmatia, where there is little cultivable land.

Minerals.—Its mineral wealth is not surpassed in any European country; it is only lately that Russia has exceeded it in the production of gold and silver. Mining has been an important pursuit in Austria for centuries, and has been encouraged and promoted by the government. Gold is found chiefly in Hungary and Transylvania, and in smaller quantity in Salzburg and Tyrol. The same countries, along with Bohemia, yield silver. Quicksilver is found in Hungary, Transylvania, Styria, and Carinthia. Copper is found in many districts, tin in Bohemia alone. Zinc

is mined chiefly in Cracow and Carinthia. The most productive lead mines are in Carinthia. Iron is found in almost every province of the monarchy, though Styria, Carinthia, and Carniola are chief seats. Antimony is confined to Hungary; arsenic, cobalt, sulphur, and graphite are produced in various parts of the empire.

The useful earths and building-stones are to be had in great profusion; likewise marble, gypsum, chalk, etc. Rock-salt exists in immense beds on both sides of the Carpathians, chiefly at Wieliczka and Bochnia in Galicia, and in the county of Marmaros in Hungary, and in Transylvania. Salt is also made at state salt-works by evaporating the water of salt-springs. There are inexhaustible deposits of coal. Austria has abundance of valuable mineral springs; about sixteen hundred are enumerated, some of them of European reputation, as the sulphur baths of Baden in Lower Austria, the saline waters of Carlsbad, Marienbad, Franzensbad, Teplitz, etc., all in Bohemia.

PARLIAMENT BUILDINGS, VIENNA

MANUFACTURES are most developed in the German portion of Bohemia, in the districts round Vienna, in Moravia and Austrian Silesia, and in Styria. The Magyar countries are far behind in this respect and Dalmatia and Bukowina have scarcely any manufactures at all. Weaving employs the largest number of hands; next in number come the metal, stone, glass and wood workers, then the workers in leather. Iron and steel goods are made in the Alps of Styria. Bohemia has a world-wide reputation for the manufacture of various kinds of glass, and the Tyrol has long been noted for the production of carved woodwork. Paper is made chiefly in Bohemia and in or near Vienna.

Cities and Towns.—The most important cities are the capital, Vienna, and eight other towns above one hundred thousand (Budapest, Trieste, Prague, Lemberg, Gratz, Cracow, Brün, Szegedin), and twenty-two others above fifty thousand.

Vienna (Ger. *Wien*, pron. *Veen*), the capital of the Austrian Empire, and (jointly with Budapest) of the dual monarchy, is situated in Lower Austria, on the Danube Canal, a south branch of the Danube, here joined by the small river Wien.

CHIEF DIVISIONS.—Vienna proper consists of the Inner City and ten suburban districts surrounding it, formerly encircled by fortifications known as the Lines, which in 1892 were replaced by a boulevard, known as the Ringstrasse. The central point of the city is the Graben, a short street in the center of the inner city, a pleasant, well-built avenue, of greater width than usual for streets within the Ring. The Stadt is the fashionable quarter, where are the imperial palace, the residences of many of the nobility, the leading churches, museums, galleries, etc., and the most elegant shops.

THE RINGSTRASSE is perhaps not surpassed in its architectural magnificence by any other street in Europe. Among the most conspicuous of the public buildings upon it are the Bourse; the University, founded in 1365 and renowned throughout the world as a medical school, has a teaching staff of five hundred and some ten thousand students; the new Rathhaus in the Gothic style, with a tower three hundred and twenty-eight feet high; the new Court Theater, the extensive and splendid Houses of Parliament; the Palace of Justice; the twin Imperial Museums of natural history and of art; the Imperial Opera House, sumptuous without and within; the Commercial Academy; the Palace of Archduke William; the Austrian Museum of Art and Industry, and the School for Art Industry.

Other institutions and buildings of interest are the Polytechnic Institute (with a Technological Museum); the Deaf and Dumb Asylum, founded by Maria Theresa; the splendid Public Hospital, the largest in Europe, and the Josephinum, a medical college founded in 1784, containing a large collection of anatomical models, etc.

MONUMENTS AND PARKS.—Of the public monuments the most noteworthy are the equestrian statues of Joseph II., in the Josephsplatz, those of Archduke Charles and Prince Eugene, and that of Francis I. in the Hofgarten; the monument of Francis II., in the inner court of the Hofburg; the grand Maria Theresa monument; the Beethoven and the Schiller monuments; the Grill-parzer monument, etc. Of the many beautiful fountains the finest is that by Schwanthaler representing Austria, with the four rivers, Danube, Elbe, Vistula. and Po.

In the Volksgarten (bordering on the Ringstrasse) is the Temple of Theseus, modeled after that at Athens, and formerly containing Canova's marble Theseus and the Minotaur, which is now in the Imperial Museum of Art.

St. Stephen's is one of the noblest Gothic edifices in Europe. It was founded in 1147, but was burned in 1258. The present edifice was begun soon after, but the tower was not finished until 1433. It has recently undergone extensive restorations, both without and within. The tower is four hundred and forty-nine feet high. The interior is rich in sculpture and in monuments; and the carved stalls in the choir and the stone pulpit are specially to be noted.

IMPERIAL ART MUSEUM, VIENNA

The great park of Vienna is the Prater (four thousand two hundred and seventy acres), extending for nearly four miles between the Donau Canal (a narrow arm of the Danube) and the main stream of the river. It was the site of the Great Exhibition of 1873, some of the buildings of which are now used for exhibitions, concerts, etc.

The Capuchin Church contains the burial-vault of the imperial family. The Duke of Reichstadt, son of Napoleon I., lies here among his maternal ancestors.

GRAND OPERA HOUSE, VIENNA

Churches and Museums.—The ecclesiastical center and the historic church of the city, is St. Stephen's Cathedral, adjacent to the Graben.

In the Minorite Church there is a fine mosaic

copy of Leonardo da Vinci's Last Supper; also the monument of the poet Metastasio.

The Augustine Church contains Canova's monument of the Archduchess Maria Christina, one of his noblest works; and in the Loretto Chapel are the silver urns that hold the hearts of many members of the imperial family.

THE IMPERIAL UNIVERSITY, VIENNA

The Church of Maria-Stiegen is a Gothic structure of the fourteenth century restored in 1820, and second in beauty only to St. Stephen's.

The elegant Karlskirche, or Church of St. Charles Borromeo, was erected in 1737 in fulfilment of a vow of Charles VI., when the plague raged in Vienna; it is in Italian style, with two slender spires, one hundred and forty-five feet high, near the porch.

The Imperial Museums now contain the Picture Gallery, arranged in schools. It is second only to the Dresden collection, is specially famous for its unrivaled examples of the Venetian school, Rubens, and Dürer, the Antiquities, comprising statuary, mosaics, inscriptions, etc., mostly Austrian; and the Ambras Collection, remarkable for its ancient armor, ivories and other carvings, etc.

INDUSTRIES.—Vienna is the chief industrial city in the empire. Machinery, scientific and musical instruments, artistic goods in bronze, leather, terra-cotta, porcelain, furniture, meerschaum pipes, etc., are among the noted manufactures. As a center of trade and finance Vienna is no less important.

SCHÖNBRUNN, two miles from Vienna, is the seat of the magnificent Summer Palace of the Emperor, with extensive gardens and pleasure-grounds. From the marble colonnade of the Gloriette there is a fine view of the city and its suburbs. In the churchyard is Canova's monument of Baroness Pillersdorf.

Prague (Ger. *Prag;* Czech *Praha*), the capital of Bohemia, is situated at the base and on the slope of the hills which skirt both sides of the isleted Moldau, two hundred and seventeen miles from Vienna and one hundred and eighteen miles from Dresden. It offers a highly picturesque appearance from the beauty of its site, and the numerous lofty towers (more than seventy in number) which rise above the palaces, public buildings, and bridges of the city.

The royal Burg, on the Hradschin (two hundred and forty feet), the ancient residence of the Dukes of Bohemia, dates mainly now from the sixteenth and seventeenth centuries, and has four hundred and forty rooms. The neighboring Cathedral of St. Vitus is still unfinished, though building was resumed in 1867. Here are the splendid royal mausoleum and the shrine of St. John of Nepomuk, containing one and one-half tons of silver. Of forty-seven other Catholic Churches the chief are the domed Jesuit Church of St.

STATUE OF THE POET GRILLPARZER IN VIENNA

Nicolas, and the Teyn Church (1407; the old Hussite Church), with Tycho Brahé's grave, and its marble statue of the Slavonic martyrs, Cyril and Methodius.

Of five bridges and two railway viaducts the most striking is the Karlsbrücke, five hundred and forty-three yards long, with gate-towers at either end, and statues of John of Nepomuk and other saints. Other noteworthy objects are the town hall, the Pulverturm, the new Czech Theatre, the old Jewish graveyard, the vast Czerni Palace and the Picture Gallery.

ROYAL PALACE, SCHÖNBRUNN, NEAR VIENNA

Prague has numerous public gardens and walks, with several noble parks close by. The manufactures include machinery, chemicals, leather, cotton, linen, gloves, beer and spirits.

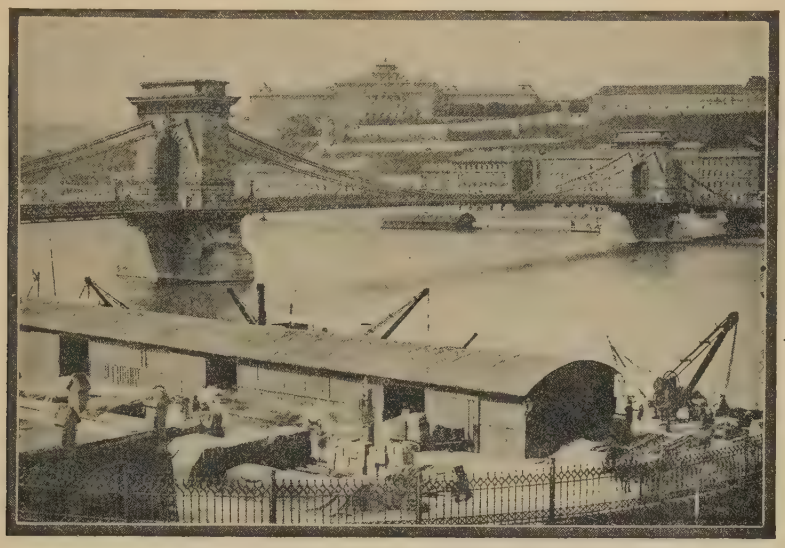
Salzburg (*sälts'börg*), is in Upper Austria, twenty-eight miles from Linz, near the Bavarian frontier, one thousand three hundred and fifty feet above sea, under some fine hills on the Salzach. It is considered one of the most beautifully situated towns of Europe. At this point the river passes between two extensive but isolated masses of rock, one of which, the Mönchsberg (Monk's Hill), is crowned by the old citadel, dating originally from Roman times, but frequently rebuilt. This portion of the city contains the fine cathedral, with a white marble façade, and built in imitation of St. Peter's at Rome.

Its industries are confined chiefly to the manufacture of musical instruments, marble ornaments.

SALZBURG, AUSTRIA, ONE OF THE MOST CHARMING TOWNS IN EUROPE, AND BIRTHPLACE OF MOZART AND HAYDN

Budapest (*boo'da-pest*; Hung. pron. *boo'do-pesht'*) is the capital of Hungary, and the second city of the Austrian Empire, consisting of Buda on the west bank of the Danube, and Pest on the opposite bank.

These twin cities are joined by five bridges: a chain bridge between the two commercial quarters; the Queen Elizabeth Bridge; the Franz Josef Bridge; the Margaret Bridge; and a railway bridge.



ROYAL PALACE AND SUSPENSION BRIDGE, BUDAPEST

Buda, the older and formerly the more important of the two parts, stands on and around two hills. On one stands the royal castle, erected by Maria Theresa, and a fortress, rebuilt after being destroyed by the Hungarians in 1849. The palace chapel of St. Sigismund contains the Hungarian regalia and the hand of St. Stephen. On the Blocksberg, to the south of this hill, stands the old citadel, while on a lower mound to the north is the Turkish mosque, built over the tomb of the saint Sheik Gül-Babas.

Other prominent buildings are the palace of Archduke Joseph, the residence of the Premier, and of the Minister of National Defense, all standing in the Georgsplatz, where is also a monument to General Hentzi, and the thirteenth-century parish church of St. John.

Pest, the more modern city, stands upon a sandy plain with fine quays along the Danube. The main streets radiate from the Belvaros, which is enclosed by boulevards replacing the old city walls.

The most notable buildings are the Houses of Parliament and Palaces of Justice, the Academy of Sciences, containing valuable art collections, and a fine library, the Bourse, and the Redoute buildings, all on the Franz Josef Quay; the National Museum Theatre and University on Museum Street; the Industrial Art Museum, on Ulloi Street; the Royal Military Academy, in the Orczy Gardens; and the Leopold Basilica on Andrassy Street, one of the most handsome thoroughfares in Europe. There are a parish Church, a Greek Church, and a Jewish synagogue, and numerous parks, including one on Margaret Island in the Danube.

Both towns have valuable baths and sulphur springs, and the united cities form a large manufacturing center for machinery, spirits, and tobacco, cutlery and metal-work, glass, etc. The most important industry is milling, the trade in grain and flour being enormous, and there is considerable commerce in cattle and swine, honey, wax, bacon and hides, timber, and coal.

Salzkammergut (*Sahltzkammergoot'*), called the Austrian Switzerland, one of the most picturesque regions of Europe, lies in a district famous for its salt mines and brine springs, and hence known as the *Salzkammergut* ("Estate of the Salt Office"). The scenery combines in rare beauty the features of valley, mountain and lake. The highest peak is the Dachstein (nine thousand eight hundred and thirty feet); of its lakes the most famous are Hallstatt, Traun or Gmünden, Atter, St. Wolfgang, Aber, Mond, and Zell. The chief seats of the salt-works are Ischl, Hallstatt, and Ebensee.

Other Important Places.—Trieste, the only great seaport of the Empire, is at

THE GOTHIC POWDER TOWER, PRAGUE

the head of its gulf, on the North Adriatic. Pola, near the southern extremity of the peninsula of Istria, is the chief naval station of Austria.

Linz, on the Danube, is the seat of a considerable trade. Steyr, on the river Enns, is noted for its steel and iron industry.

Northern Styria is the center of the Austrian steel and iron industry, carried on more especially around Leoben. The capital, Graz, is a staple place for the manufacture of machinery, and one of the most agreeable of Austrian capitals, and a favorite place of residence.

Semmering, an Austrian Alpine pass (three thousand two hundred and nineteen feet) connecting Vienna with Graz, though the lowest of the Alpine passes, is traversed by the first railway (1854) to be carried across the Alps. The viaducts of the Semmering railway, some of them with several tiers of arches, are among the grandest works of engineering. The Semmering road begins at Gloggnitz, at an elevation of one thousand four hundred and twenty-six feet, and is carried along the face of abrupt precipices over bridges and through tunnels, affording views of the grandest and wildest scenery en route. This part of the road is twenty-five miles long, and cost more than seven millions of dollars.

Innsbruck, on the Inn, is the capital of the Tyrol, the most alpine part of the monarchy. Its principal rivers are the Inn, in the north, and the Etsch or Adige, in the south, the mountain range separating them being crossed by the Pass of the Brenner (five thousand eight hundred and sixty feet). On the Adige are Botzen, Trent, and Roveredo, the two last inhabited by Italians.

Reichenberg, in the north, is the center of the textile trades; Teplitz and Karlsbad, at the foot of the Erzgebirge, are famous watering-places; Pilsen, in the west, is noted for its beer. Königgrätz and Sadowa, where the battle was fought which decided the Seven Weeks' war in 1866, are in the east.

Brünn is the great center of the Austrian woolen trade; near it is the old state prison, Spielberg. Olmütz is a strong fortress on the March.

Lemberg and Cracow (the ancient capital of Poland) are the centers of trade, and the marts for the agricultural produce.

Bukowina is a small duchy at the head of the Sereth and other rivers falling into the Black Sea, with Czernowitz for its capital. About forty per cent of the inhabitants are Roumanians.

Pressburg, near the eastern frontier, is the old coronation city; Komorn, lower down on the Danube, is famous as a fortress; Szegedin, the chief town on the Theiss, was almost wholly destroyed by floods in the year 1878.

Fiume, at the head of the Quarnero Gulf, is the chief seaport of Hungary.

HISTORY OF AUSTRIA

The empire of Austria arose from the smallest beginnings at the end of the eighth century. In 796 a Margraviate, called the Eastern Mark (i. e. "March" or frontier-land), was founded as an outpost of the empire of Charlemagne, in the country between the Enns and the Raab. The name Oesterreich appears first in 996.

Rise Under the Hapsburgs.—In 1156 the mark was raised to a duchy; and after coming into the possession of the House of Hapsburg in 1282, it began its period of growth toward a powerful state. The princes of that house extended their dominion by marriage, by purchase, and otherwise, over a number of other states, including the crowns of Bohemia and Hungary; and from 1438 down to the nineteenth century they held almost without interruption the throne of the German empire (nominally "the Holy Roman Empire")—the emperor being the most conspicuous, if not always the most powerful personage among the crowned heads of Europe.

Hapsburg Power Through Marriage.—The most pronounced rise of Austria and of the House of Hapsburg to historical eminence may be said to date from the reign of Maximilian I. (1493-1519). By marrying Mary, daughter of Charles the Bold (1477), he acquired possession of the Netherlands. Through the marriage of their son Philip with Joanna of Spain, the Houses of Austria and Spain were united.

Passes to Charles V. of Germany.—As Philip died in 1506, his elder son, the celebrated Charles V., became heir to the united monarchies, and was elected emperor of Germany in 1519. Thus, by a succession of fortunate marriages, the House of Hapsburg became the most powerful dynasty in the world.

Charles V., however, resigned all his German territories to his younger brother, Ferdinand I., who was thus the continuation of the Austrian branch of the line. Under Ferdinand the power of Austria greatly increased.

Division of the Empire.—In the partition of the inheritance that took place among Ferdinand's three sons, the eldest, Maximilian II., received the imperial crown along with Austria, Hungary and Bohemia; the second, Ferdinand, Tyrol and Upper Austria; the third, Charles, got Styria, Carinthia, etc. Maximilian II. was fond of peace, tolerant in religion, and a just ruler. He died in 1576; and of his five sons, the eldest, Rudolf II., became emperor.

Rudolf II. was negligent, leaving everything to his ministers and the Jesuits. His war with the Porte and Transylvania brought him little credit; and the Protestants of Bohemia, oppressed by the Jesuits, extorted from him a charter of religious liberty. In 1608 he was obliged to cede Hungary, and in 1611 Bohemia and Austria, to his brother Matthias.

Matthias, who became emperor in 1612, ceded Bohemia and Hungary to his cousin Ferdinand, son of the Archduke Charles of Styria, third son of Maximilian II. Matthias lived to see the outbreak of the Thirty Years' war, and died in 1619.

Ferdinand II. and the Thirty Years' War.—Bohemia refused to acknowledge his successor, Ferdinand II., to whom all the Austrian possessions had again reverted, and chose the Elector Palatine, Frederick V., the head of the Protestant Union, as king. This election gave the signal for the Thirty Years' war, in which the House of Austria took the lead, both as the champion of Catholicism, and the head of a power which aimed at universal domination in Germany and in the Christian world. The battle of Prague (1620) subjected Bohemia to Ferdinand, who formally set about rooting out Protestantism in that country and in Moravia. The emperor also succeeded in extorting acknowledgment of his sovereignty from the states of Austria; and here, too, Protestantism, which had made great progress since the time of Luther, was mercilessly suppressed.

Under Ferdinand's successor, the Emperor Ferdinand III. (1637-1657), Austria continued to be a theater of war; and at the peace of Westphalia (1648) had to cede Alsace to France.

Leopold I. and the War of the Spanish Succession.—Ferdinand III.'s son and successor, Leopold I., provoked the Hungarians to rebellion by his severity. The struggle between Leopold and Louis XIV. of France for the heirship to the king of Spain led to the War of the Spanish Succession, during which Leopold died, in 1705.

His eldest son and successor, the enlightened Joseph I., continued the war. He died childless in 1711, and was succeeded by his brother, Charles VI.

Hapsburg-Lorraine Line of Rulers.—With the death of Charles VI., in 1740, the male line of the Hapsburgs became extinct, and his daughter, Maria Theresa, who was married to the duke of Lorraine, assumed the government. For many years it had been the aim of Charles to secure the adhesion of the European powers to the Pragmatic Sanction, by which the possessions of the Austrian crown should pass to Maria Theresa. Those powers during his lifetime had promised to second his wishes, but he was no sooner in his grave than nearly all of them sought to profit by the accession of a female sovereign.

War of the Austrian Succession.—A great war arose, in which England alone sided with Maria. Frederick II. of Prussia conquered Silesia. The Elector of Bavaria was crowned king of Bohemia, and elected emperor as Charles VII. in 1742. The Hungarians, however, stood by their heroic queen, who was soon able to wage a fairly successful war against her numerous foes. At the death of the empress in 1780, the monarchy had an extent of two hundred and thirty-four thousand square miles, with a population of twenty-four millions. The administration of Maria Theresa was distinguished by unwonted unity and vigor, both in home and foreign affairs.

Her successor, Joseph II., was an active reformer in the spirit of the enlightened despotism of the times, though often rash and violent in his mode of proceeding. He was succeeded in the government by his brother, the grandduke of Tuscany—as German emperor, Leopold II.—who succeeded in pacifying the Netherlands and Hungary.

Austria and the French Revolution.—At the outbreak of the revolution in France the fate of Leopold's sister, Marie Antoinette, and her husband, Louis XVI. of France, led him to an alliance with Prussia against France; but he died in 1792 before the war broke out. War was declared by France on his son, Francis II., the same year, and by the treaty of Campo Formio, 1797, Austria lost Lombardy and the Netherlands, receiving in lieu the Venetian territory.

In 1795, at the second partition of Poland, it had been augmented by western Galicia.

Francis, in alliance with Russia, renewed the war with France in 1799, which was ended by the peace of Lunéville. It is needless to follow all the alterations of boundary that the Austrian dominions underwent during these wars. The most serious was at the peace of Vienna (1809), which cost Austria forty-two thousand square miles of territory. It was in 1804, when Napoleon had been proclaimed emperor of France, that Francis declared himself hereditary emperor of Austria as Francis I. On the establishment of the Confederation of the Rhine, he laid down the dignity of German emperor, which his family had held for nearly four hundred years.

The humiliating peace of Vienna was followed (1809) by the marriage of Napoleon with the Archduchess Maria Louisa, and in 1812 Austria figured as the ally of Napoleon in his great campaign against Russia, but she did not give much active assistance. In August of the following year Austria joined the grand alliance against France and the Austrian general, Schwarzenberg, was entrusted with the chief command of the allies forces, which at the battle of Leipzig and in the campaign of 1814 broke the power of Napoleon.

Congress of Vienna and Subsequent Period of Metternich.—The sacrifices and great services rendered by Austria in the gigantic struggle received full consideration at the treaty of Vienna (1815). As recompense for the loss of the Netherlands she received Venice and Dalmatia, which afforded an outlet for her foreign trade.

After that time Austria, under the diplomatic guidance of Prince Metternich, exerted a powerful influence in European politics generally, and more especially in the German Confederation, of which her emperor was president. The death of Francis I. in 1835 made little alteration in the policy of Austria; Ferdinand I. trod in his father's footsteps. The political alliance with Russia and Prussia was drawn closer by a personal conference of the emperor with Nicholas I. and Frederick-William III. at Teplitz in 1835.

Revolution of 1848.—In Austria, after the fall of Metternich from power, the revolutionary period of 1848-1849 was one of exceptional severity, the movement for constitutional freedom being complicated by the revival of the national spirit in Hungary, Italy and Bohemia. The time was everywhere ripe for revolt, when the fall of Louis-Philippe of France (February 24, 1848), gave the signal for the outbreak of the revolutionary elements all over Europe. Nowhere was the spirit of change stronger than in Vienna, which for many months became a scene of confusion.

The leaders of the popular movement in Vienna were in sympathy with Hungary, and when the imperial troops were ordered to suppress the national rising there, the citizens again rose in insurrection. In the meantime the military forces had withdrawn from the capital in order to prevent the Hungarians coming to the aid of the Viennese. Vienna was now besieged, and surrendered at the end of October, after a resistance of eight days.

Francis Joseph Emperor.—The reaction was triumphant, and the leaders of revolt severely punished; but as Ferdinand had not shown sufficient vigor in the great crisis, he was persuaded to abdicate, and Francis Joseph was declared emperor at the age of eighteen. Thus restored, the central authority had now to

assert itself in Hungary and to complete the reconquest of northern Italy. With the surrender of Venice, which took place in August, the subjugation of Italy was complete.

Conquest of Hungary.—In Hungary, the Magyars, though the Germans and Slavs within the country itself were hostile to them, began the campaign of 1849 with decided success. But the government had already solicited the aid of Russia, whose armies, entering Transylvania and Hungary, added to the imperial cause the irresistible weight of numbers. Surrounded on every side by superior forces, the Hungarians were completely beaten. It was in vain that Kossuth transferred the dictatorship to General Görgei. Görgei, whether from treachery, as the other Magyar leaders maintained, or from necessity, as he himself averred, laid down his arms to the Russians at Vilagos (August 13). The surrender of Komorn, in September, completed the subjugation of Hungary, which was treated as a conquered country.

The ten years which followed on the revolutionary troubles of 1848 were a period of reaction and of absolutism. A constitution which had been granted in 1849 was soon annulled. The policy pursued was one of strong centralization under a bureaucratic government, by which the claims of nationality and of freedom were alike disregarded. Liberty of the press and trial by jury were set aside. A rigorous system of police was maintained. The aim was to Germanize the whole empire and to crush the aspirations of both Slavs and Hungarians. The Church pronounced against national freedom, and supported the central authority and received great privileges by the Concordat of 1855. The result of all these proceedings was only to irritate the national feeling in Hungary, Italy and Bohemia.

Struggle Between Austria and Prussia.—On the confused arena of German politics, the struggle for ascendancy was kept up between Austria and Prussia. In 1850 the two powers were armed and ready to come to blows with reference to the affairs of Hesse-Cassel; but the bold and determined policy of Schwarzenberg prevailed, and by the humiliating arrangement of Olmütz, Prussia gave way. For a few years longer the preponderance of Austria in the German Confederation was secured.

The rule of Austria in Italy had always been unsatisfactory. From her own provinces in Venice and Lombardy she controlled the policy of the courts of central and southern Italy, and her influence tended invariably towards the suppression of national feeling and popular liberty.

Loss of Italian Possessions.—Sardinia was the only state that worthily represented the spirit of the Italian people. In the spring of 1859 it began to arm against Austrian supremacy. Austria demanded immediate disarmament, on pain of war; but Sardinia refused. Austria accordingly commenced hostilities by crossing the Ticino at the end of April, 1859. Sardinia having secured the aid of France, the Austrians were defeated at Magenta, Solferino and elsewhere, and their emperor was fain to seek an armistice from Napoleon. On July 11 the two potentates met at Villafranca, and concluded a peace, ceding Lombardy to Sardinia. Venice was all that still remained of the Italian possessions of Austria.

Austro-Prussian War.—The rivalry of Prussia and Austria for influence in the Germanic body of states dated from the rise of Prussia to be a leading power. The arrangement of Olmütz in 1850 had left a painful feeling of humiliation in the minds of the Prussian statesmen. The long rivalry was now to be brought to a decisive issue. In 1864 the combined Prussian and Austrian forces drove the Danes out of Sleswick-Holstein, but the two victors quarreled about the subsequent arrangements. War was declared, and in 1866 the Austrian armies in Bohemia were completely beaten by the Prussians, in a campaign of seven days, which closed with the great defeat of Königgrätz or Sadowa.

Period of Reforms.—After the great war of 1866 the history of Austria has been concerned chiefly with two important interests. In the first place, the government had to attempt an arrangement of the conflicting claims and rights of the peoples constituting the empire; in the second place, it has had to establish working relations with the great neighboring powers, Germany and Russia, and especially with the latter, on the Eastern Question.

Union of Austria and Hungary.—Hungary's claims to be recognized as a separate and distinct country were now, with great advantage, pressed forward. In 1867 its political rights were successful in being regarded as justified. This agreement was the famous Ausgleich, which has since been in force, and which has to a sufficient degree justified its adoption.

At the end of 1867 the first parliamentary ministry was formed. The Concordat was set aside. Education was freed from the control of the Church. Marriage was placed under the jurisdiction of the civil power. The press laws were relaxed. Finally, the Prussian system of military organization was introduced.

In the foreign affairs of Austria the chief aim was to arrive at a satisfactory understanding with Germany and Russia. After 1871 Bismarck arranged as between Germany, Austria and Russia a "Three Emperors' Alliance," which after the Russo-Turkish war of 1877-1878 was superseded by an alliance between Germany and Austria. This, by the inclusion of Italy, in 1882, became the Triple Alliance, which remained in full force down to the great European war of 1914.

During the Turkish revolution of 1908 Austria-Hungary annexed the Turkish provinces of Bosnia and Herzegovina, which the Treaty of Berlin had placed under Austro-Hungarian administration and military occupation in 1878.

Racial Difficulties Bearing Upon the European War, 1914-1917.—The multiplicity of races and their mutual jealousies rendered the task of the central government in Austria-Hungary both delicate and difficult. (See Peoples and Races.) Russia, as a Slav nation and a great power, had long exercised a predominant influence in the Balkans. Acting under this influence, Servia secretly fostered aspirations in the direction of a Pan-Slavic

propaganda with the apparent object of not only lessening Austrian influence in the Balkans but of breaking up, through internal defections, the Austrian Empire; from the accomplishment of this Servia hoped to profit.

The Slavs are closely allied with Russia. The spread of Pan-Slavism constituted a menace to the very existence of the Dual Monarchy. The growth of German and Russian aspirations directed at expansion through the Balkan States had, therefore, a direct connection with the racial element of which Pan-Slavism was but one manifestation. As an evidence of the spread of the doctrine of "Pan-Slavic Unity" and of the bitterness of the racial antipathy which it engendered, the Austrian Archduke Francis Ferdinand and his wife, the Duchess of Hohenberg, were assassinated on June 28, 1914, at Sarajevo, the capital of the Austrian province of Bosnia. This act led directly to a declaration of war against Servia on July 28th, followed by an Austrian invasion on July 30th. (Further causes and details of the war will be found under the European War.)

SOVEREIGNS OF AUSTRIA-HUNGARY.

The following is a list of the Hapsburg rulers of Austria (Dukes and, from 1453, Archdukes of Austria, from 1526, also Kings of Hungary and Bohemia, from 1804 Emperors of Austria).

HOUSE OF HAPSBURG

Albert I	1282
*Rudolf II	1282
*Rudolf III	1293
Frederick (III. as rival Imperial claimant)	1307
*Leopold I	1314
*Albert II	1314
*Rudolf IV	1358
*Albert III	1365
*Albert IV	1395
Albert V. (II. as Emperor, King of Hungary and Bohemia)	1404
*Ladislaus (King of Hungary and Bohemia)	1439
Fredrick V. (III. as Emperor)	1457
Maximilian I	1493
Charles I. (V. as Emperor)	1519
Ferdinand I	1520
Maximilian II	1564
Rudolf V. (II. as Emperor)	1576
Matthias	1611
Ferdinand II	1619
Ferdinand III	1637
Leopold I	1658
Joseph I	1705
Charles II. (VI. as Emperor, III. of Hungary)	1711
*Maria Theresa	1740

HOUSE OF HAPSBURG-LORRAINE

Joseph II	1780
Leopold II	1790
Francis I. (II. as Emperor)	1792
*Ferdinand I. (V. of Hungary)	1835
*Francis Joseph I	1848
Charles Francis Joseph	1916

*All except those marked with an asterisk likewise filled the throne of the Holy Roman Empire.

RUSSIA

Russia extends over eastern Europe, the whole of northern Asia, and a part of central Asia. This area, which is more than twice as large as Europe, and embraces one-sixth of the land-surface of the globe, has a population estimated at near one hundred and seventy-four millions. Eurasian Russia consists of two well-defined parts: European Russia less than one-fourth of the whole but including nearly three-fourths of its population; and Asiatic Russia. The inhabitants of European Russia mostly belong to the Slavic branch of the human race.

The subdivisions are indicated in the following table:

Governments and Provinces	Area English Square Miles	Population Jan. 1912
European Russia:		
Russia proper (50 Provs.)	1,862,524	122,550,700
Poland (10 Provs.)	49,018	12,776,100
Finland (Grand Duchy)	144,178	3,140,100
Asiatic Russia:		
Caucasia (11 Provs.)	180,703	12,288,100
Central Asia (10 Provs. and Regions)	1,325,530	10,727,000
Siberia (8 Provs. and Regions)	4,786,730	9,577,900
Dependencies:		
Khiva	26,028	800,000
Bokhara	78,524	1,500,000
Inland Lakes	317,468	.....
	8,770,703	173,359,900

The various sections of European Russia differ greatly from one another, and have thereby given rise to certain *popular divisions* that are even better known generally than the strictly governmental provinces. These, with their distinguishing features, may be indicated as follows:

Great Russia (Muscovy).—All the central and northern regions to the Arctic shores. Chief towns: Moscow, Tula.

Except on its outskirts, this region presents everywhere the same aspects, wide, undulating plains covered with cornfields and dotted with small deciduous forests. The soil is of very moderate fertility in the north, but very fertile in the black earth belt of the south.

The Great Russians, numbering about fifty-five millions, are a vigorous and manly stock, usually rather light-haired, with blue or brown eyes, well-formed hands and feet, and a serious, kindly, but somewhat crafty, temperament, an inborn disposition for a wandering life, a very small regard to the value of time, and (especially in the peasantry) an extreme carelessness and slovenliness in all details of daily life.

Little Russia, or the Ukraine.—In the southwest. Chief town: Kieff.

The little Russians, over twenty-two millions in all, are settled in the Ukraine, which contains also in the borderlands some twelve per cent of Jews and six per cent of Poles. Their religion, like their love for music and poetry and their passion for country life, they share with their relations on the north and northeast, but in their developments of folklore and popular song, and in the more feminine character both of their physique and their intellect, they offer marked peculiarities. The Little Russians of the Dnieper basin are closely allied to the Ruthenians of Austria-Hungary.

The Ukraine comprises the governments of Tchernigoff, Kieff, Poltava, and part of Kharkoff, as well as Volhynia and Podolia on the spurs of the Carpathians, the richest and most populous parts of Russia. The soil is mostly a rich black earth, and assumes farther south the aspect of fine grassy steppes, or prairies, yielding rich crops of wheat.

PETER THE GREAT IN HOLLAND

The practical ambition of Peter the Great has probably never been surpassed by any sovereign in history. He began empire building with his travels in 1697. It was an unparalleled step for a young sovereign of twenty-five to take: to withdraw from his kingdom and journey abroad in order to learn the art of government. He was deeply interested in all branches of engineering, especially ship-building, which he first studied in Holland, working as an ordinary laborer in a dockyard. In 1698 Peter went to England to pursue his studies in the theory and practice of ship construction, which he did by visiting the dockyards of Woolwich, Chatham, and Deptford.

Eastern Russia.—Chief towns: Astrakhan, Kazan, Samara, Saratoff.

This part of the country is more elevated, but less effectively drained; and vast forests stretch from the upper Volga to the Urals.

The peoples are of Turkish origin and include the Tartars of Kazan; the Nogai Tartars of the Crimea in the south, and the Kirgiz on the Caspian. The Bashkirs, Chuvash, and others, in the Ural and Volga, are Tartarized Finns. The Kalmucks may be taken as the purest type of the Mongols; they are short, swarthy, broad-shouldered horsemen, black-haired and black-eyed, the eyes slanting down toward the flat nose.

South Russia.—Along the Black Sea. Chief towns: Odessa, Nikolayeff, Kisheneff.

This is chiefly the steppe-region, a belt more than two hundred miles wide along the littoral of the Black Sea and the Sea of Azov, and extends east through the region of the lower Volga and Ural till it meets the steppes of central Asia.

Here are gently undulating plains, clothed with rich grass and coated with a thick layer of fertile black earth.

In order to people Bessarabia after its conquest in the eighteenth century without depriving the Russian landowners of their serfs, several races of foreigners, as Moldavians, Wallachians (Vlachs), Servians, Greeks, Germans, and even Scotch, were freely invited to settle there. The population of the steppe-region exceeds thirteen millions.

Western Russia.—Including the Lithuanian provinces of Kovno, Vilna, and part of Grodno and Vitebsk, drained by the Niemen and the upper Dwina, and other portions of the former kingdom of Poland. Chief town: Vilna.

Here dwell the White Russians, who number about six millions, but they are more mixed with Poles, Jews and Little Russians. In all essentials they are merely "poor relations" of the Great Russian family, living, on the whole, in a more degraded and undeveloped state than any other Russians.

The Baltic Provinces.—The coast-lands of the Gulfs of Finland and Riga. Chief towns: Petrograd (St. Petersburg), Revel, Riga.

These are four Russian governments bordering on the Baltic—viz., Courland, Livonia, Esthonia, and Petrograd; or in a restricted sense, often the first three. The Baltic provinces once belonged to Sweden, except Courland, which was a dependency of Poland. They came into the possession of Russia partly in the beginning of the eighteenth century through the conquests of Peter the Great, partly under Alexander in 1809.

They occupy an undulating plain three hundred to eight hundred feet above the sea. Owing to the influence of the sea, this region enjoys a milder climate than the rest of Russia, and has maintained its excellent forests, chiefly of oak. The soil is of moderate fertility.

The more important non-Slavic peoples of this region are the Lithuanians (one million two hundred and fifty thousand) and Letts (one million five hundred thousand), chiefly in Kovno, Vilna, Grodno, Vitebsk, Courland, and S. Livonia. The Germans (one million five hundred thousand) are mainly descendants of the mediæval conquerors of the east Baltic coasts (Teutonic Knights, Knights of the Sword, and their followers) and of the agricultural colonists brought by Catherine II.

The Grand-Duchy of Finland.—In the northwest, next Scandinavia. Chief towns: Viborg, Helsingfors, Abo.

Finland was ceded by the Swedes in 1809, but still retains an independent administration. The interior, chiefly elevated plateau, consists largely of forest land, and is well supplied with lakes, many of which are united by canals. (See also under Europe.)

Education is highly advanced; Swedish and Finnish are the two languages of the country, Russian being practically unknown. There is an excellent Saga literature, and the beginnings of a modern literature. The Finns came under the dominion of the Swedes in the twelfth and thirteenth centuries, and were by them Christianized.

The Finnish race includes the Finns and the Karelians (two million four hundred thousand in Finland and three hundred and fifty thousand in European Russia); the Esthonians, the people of Livonia, and other Western Finns in the Baltic Provinces (about one million); the Lapps and the Samoyedes in the far north; and the Volga Finns and the Ugrians (one million seven hundred and fifty thousand in European Russia and fifty thousand in Siberia). The Eastern Finns are being rapidly absorbed by the Russians; but the Western Finns warmly cherish their nationality.

**Poland.*—In the west, next Germany. Chief town: Warsaw.

Surface Features.—In general these embody the plains of European Russia and the lowlands and plains that extend to the north of the two great plateaus of Asia—the high plateau of East Asia and the western plateau of Persia and Armenia.

In European Russia, apart from the Caucasus, the Urals, and the Crimea, the only districts rising above one thousand feet are the Valdai hills at head of the Volga, the Timan range (over three thousand feet) in the Pechora basin, several heights in Russian Lapland (over one thousand five hundred), and some in Ukraine (over one thousand). The main divisions of its landscape are the treeless northern tundras, frozen in winter, grassy in summer; the rock and lake plateau of Finland; the immense central forest region, the cultivated parts of which supply Europe with grain; and the treeless steppes, which lie across the south of the plain from the saline borders of the northern Caspian toward Roumania on the west.

In Western Asia, the Caucasus is a single chain, so narrow that the same summits may be seen from the steppes which reach out from its northern base, and from the deep valleys which separate it from the heights of Armenia on the south. It has thus no great valleys in the direction of its length. The spurs descending from the main chain have deep gorges or troughs between. The culminating points are the Elbruz peak and Koshtan Tau, towards the western end of the chain; and Mount Kazbek, near the middle of it—all rising grandly from deep valleys.

The two most important passes over it were called in ancient times the Caucasian and Albanian gates. The former, now called the Dariel Pass, lies close to the eastern base of the Kazbek, and is a narrow cleft eight thousand two hundred and fifteen feet above the sea, available for carriages in the summer. The latter skirts the eastern termination of the range on the shores of the Caspian.

Over the whole chain vegetation is vigorous, but more luxuriant on the warmer southern slopes. The valleys opening in that direction are highly fertile, producing rice and cotton and silk, indigo, tobacco, and vines, and luxuriant woods. The northern slopes, exposed to the keen winds of the steppes, are characterized by bare pasture-lands and scattered firwoods.

All Western Siberia, nearest the Ural belt and European Russia, is a vast plain rising almost imperceptibly from the shores of the Arctic Ocean to the Kirghiz steppes and the base of the Altai mountains, which spring up from it like a

*Russian Poland was created into an independent kingdom by a joint edict of Germany and Austria-Hungary promulgated at Warsaw November 5, 1916. What its future status may be when the map of Europe is re-adjusted after the close of the European War is uncertain. For the present it is given a place among the independent nations.

wall, forming the northern buttress of the great tableland of Central Asia. The northern border of this plain is occupied by the marshy frozen tundras; the broad central belt is covered with forest, in the cleared spaces of which the soil is fertile and well suited to agriculture; all the southern portion of it is occupied by treeless steppes which reach away south towards the Caspian and Aral Seas.

The chief elevation in eastern Siberia is a chain of volcanic mountains running down the center of the peninsula of Kamchatka, some of whose peaks reach an elevation of seventeen thousand feet.

Rivers.—The chief rivers of Russia are the Niemen, the Dwina, the Lovat (continued by the Volkhov and the Neva), the Onega, the Dnieper, the Don and the Volga. By means of three lines of canals and canalized rivers, which connect the upper tributaries of the Volga with the streams that flow into Lakes Onega and Ladoga, the real mouth of the Volga has been transferred from the Caspian to the Gulf of Finland—Petrograd being the chief port of the Volga basin. The upper Volga and the upper Kama are also connected by canals with the North Dwina, and the Dnieper with the Düna, the Niemen, and the Vistula.

The rainfall of Russia is small, and as part of it falls in the shape of snow, the rivers are flooded in spring and in early summer. During the winter navigation of course ceases.

The Lake District.—This region lies in the north, and includes the governments of Petrograd, Novgorod, and Finland. The lakes in the district are well-nigh innumerable, the government of Novgorod alone containing more than three thousand lakes. The chief lakes of Finland are the Enare and Saima. Lake Ladoga is the largest lake in Russian Europe. For a third of the year its surface is frozen. The lake abounds with fish, and has a peculiar species of seal. The Neva flows from the lake into the Gulf of Finland.

Lake Onega is joined up to the White Sea by means of a series of lakes and streams.

Lake Ilmen is formed by the meeting of a number of rivers in a shallow depression; the average depth does not exceed thirty feet.

Lake Peipus, a part of which is called the Lake of Pskov, connects with the Gulf of Riga and with the Gulf of Finland. This lake also is very shallow and does not in any part exceed a depth of ninety feet.

Seaboard and Islands.—The ports on the Arctic coast are of little importance, since for nearly three-quarters of the year the outlets are frozen.

The White Sea with its port, Archangel, had lost much of the importance which it formerly possessed until brought into use during the European war in 1916-1917.

The Bering Sea and the coasts which border on the Sea of Japan lose much of their value because they are bleak and inhospitable. The great gulf which has the town of Vladivostok at its head is separated by miles of waste land from the interior, and the value of one of the most magnificent harbors in the world suffers much from this fact.

The sea which is of most importance to Russia is the Baltic, with its gulfs of Bothnia, Riga, and Finland. The chief Russian ports are to be found situated on its banks, and yet it can in no respect be regarded as a purely Russian sea.

The chief islands of the Baltic are: the Aland Archipelago, Dago, Oesel, Mohn, Hochland, and Kotlin, which contains the fortress of Cronstadt.

The Black Sea is becoming of more and more importance every year. The coast lands are being developed, and as the produce of the interior becomes greater so the importance of the Black Sea increases.

The Sea of Azov is the greatest inlet of this sea, but on the whole the importance of the Black Sea is lessened by the fact that it has so few good ports. The best are those of the peninsula of the Crimea, but these are too remote to be of any great importance.

Odessa is the second port of Russia and the greatest port of the Black Sea. Sebastopol is the great naval station, and Batum owes its importance to the fact that it is the port of the oil fields of the Caucasus.

The great inland sea of Russia, the Caspian, lacks importance chiefly because of the fact that it is an inland sea. It forms a good means of communication from the Transcaucasian provinces to Central Asia, and also between Central Asia and Persia; but although attempts have been made to unite it with the Black Sea, the fact that it lies seventy feet below sea-level prevents any real good from being done. It is, however, of vast importance as a fishing center, and supplies almost the whole of Russia with fish.

Climate.—In European Russia, except in the Baltic provinces, the south of the Crimea, and a narrow strip of land on the Black Sea, the climate is continental. A very cold winter, followed by a spring which sets in rapidly; a hot summer; an autumn cooler than spring; early frosts; and a small rainfall, chiefly during the summer and autumn, are the main features. The winter is cold everywhere. All the rivers are frozen over early in December, and they remain under ice for from one hundred days in the south to one hundred and sixty days in the north.

Products and Industries.—Excepting along the tundra belt on the Arctic coasts, in Finland, and in the saline steppes of the southeast, the cultivation of grain extends all over the great Russian plains.

Agriculture and Forests.—Rye and barley, oats and flax, are the chief crops in the north; wheat and vines, hemp and tobacco, the products of the center and the south. The south central governments, extending from the Upper Oka to the Ukraine on the Dnieper, may be regarded as the granary of Russia, for they produce a third of all its corn supply. Russia is thus most important of all as a grain-producing country.

Its forests extend over about forty per cent of the surface—pine and fir and birch in the north; oak and elm and lime in the center and south. The timber is sent down the Niemen and Vistula to the Baltic, and to Archangel in the White Sea, in enormous quantities for the supply of western Europe. In Russia itself the larger portion of the houses are built of wood.

Live Stock and Fisheries.—The steppes of the south are the great pastoral lands of Russia, which possess more than forty-five millions of sheep, about twenty-five per cent yielding fine wool; twenty-five millions of cattle; and twenty millions of horses. Russian leather is famous. Swine are also kept in very large numbers all over the land; the export of bristles and brushes from Russia is very large. Reindeer form the wealth of the Lapps and Samoyeds in the north; camels of the Tartars in the southeastern steppes. Hunting the bear, wolf, fox, and deer, and trapping the sable in the forests for their skins, give employment to many. The Caspian, as well as the Sea of Azof, the Black Sea, and the great rivers, are rich in fish—tunny, sturgeon, salmon, anchovy. Most caviare is made at Astrakhan on the Caspian.

MINERALS.—The Obdorsk and Ural Mountians contain very great mineral riches, and, with the Altai range, are the principal seat of mining and metallic industry, producing gold, platinum, copper, iron of very superior quality, rock-salt, marble, and kaolin, or china-clay. Silver, gold, and lead are also obtained in large quantities from the mines in the Altai Mountains. Russia is now the largest producer of petroleum in the world. Great supplies of petroleum and naptha are found in the Baku, Kerch, and Taman. An immense bed of coal, both steam and anthracite, and apparently inexhaustible, has been discovered in the basin of the Donetz (between the rivers Donetz and Dnieper). Other mineral products are: gold, platinum, pig iron, steel and rails, copper, quicksilver, salt and lead.

Education.—From the close of the sixteenth century onward till 1861, the greater portion of the inhabitants of Russia were serfs, belonging either to the crown or to private individuals. Under these circumstances it is not surprising that the masses of the people in Russia are without education. Finland is in advance of all other parts of the empire in respect of education; it possesses a separate system. Probably not more than ten per cent of the population have received instruction of any kind. The control and maintenance of primary schools is divided between the Ministry of Public Instruction and the Holy Synod. Conditions are, however, improving. Secondary institutions comprise gymnasia and good schools, but numbers and attendances are small. Special schools are increasing in number, especially in the European cities. There are universities at Kazan, Kieff, Kharkoff, Moscow, Odessa, Petrograd, Saratoff, Tomsk, Yurieff and Warsaw.

Religion.—The great bulk of the Russians—excepting a few White Russians professing the Union—belong to the Greek-Russian Church, or to one of its numberless sects of dissenters. The Poles and most of the Lithuanians are Roman Catholics; while the Finns, the Esthonians, and other Western Finns, the Swedes, and the Germans, are Protestant (about four millions).

Cities and Towns.—The largest towns in European Russia are Petrograd (2,018,596), Moscow (1,173,427), Warsaw (756,426), Riga (500,000), Odessa (449,673), Lodz (351,570), Kieff (329,000), Kharkoff (197,405), Vilna (162,633), Saratoff (143,431), Kazan (143,707), Ekaterinoslav (135,552), Rostoff (119,889), Astrakhan (121,580), Tula (109,279), and Kishineff (125,787); while Nijni Novgorod, Nikolaieff, Samara, and Minsk have populations between 90,000 and 95,000. In Asiatic Russia the Caucasus contains two towns with over 100,000 inhabitants: Baku (179,133), and Tiflis (160,645); Turkestan contains five large towns, Tashkend (156,000), Namangan, Samarkand, and Andijan; in Siberia Vladivostok has 90,000 (one-third Chinese), Tomsk, Irkutsk, and Ekaterinburg have each about 50,000 inhabitants. Nijni Novgorod, though small, is a station on the Trans-Siberian Railway, and has annually the largest fair in the world.

PALACE OF PETER THE GREAT, FOUNDER OF PETROGRAD

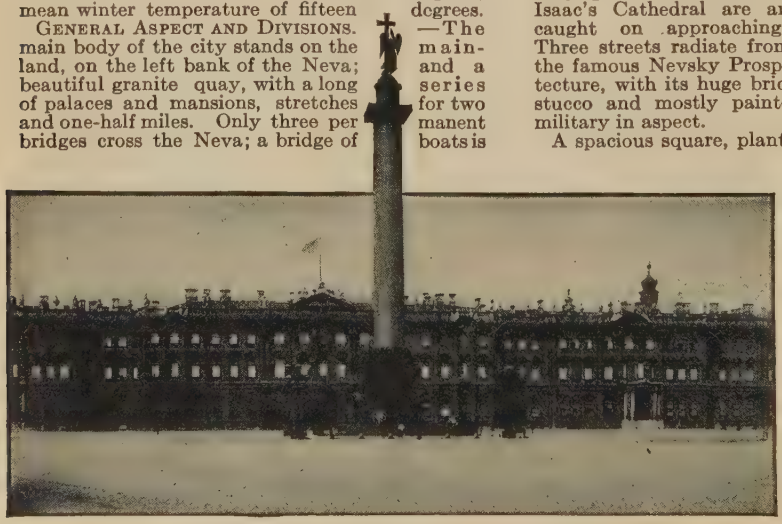
Petrograd, the splendid looking metropolis of the Russian Empire, is situated on the River

Neva, near its entrance into the Gulf of Finland. The flat and low marshy ground upon which the city is built only recently emerged from the sea. The mighty Neva, which flows thirty-six miles from Lake Ladoga, subdivides into many branches, thus forming some one hundred islands.

VIEW OF PETROGRAD, RUSSIA, FROM THE ISLAND

Peter the Great began to build, in 1703, a small hut for himself, and some wooden hovels near the old fort. Now the quays form noble uninterrupted walks for several miles on each side of the broad, deep, rapid, and clear river. The climate is cold, damp, and changeable with a mean summer temperature of sixty-four degrees, mean winter temperature of fifteen degrees.

General Aspect and Divisions.—The main body of the city stands on the main-land, on the left bank of the Neva; and a beautiful granite quay, with a long series of palaces and mansions, stretches for two and one-half miles. Only three permanent bridges cross the Neva; a bridge of boats is constructed each spring and removed each autumn.



THE IMPERIAL WINTER PALACE, PETROGRAD

The island Vasilievsky, between the Great and Little Nevas, contains the Stock Exchange, the Academy of Sciences, the University, the Philological Institute, the Academy of Arts, and various schools and colleges.

On the Petrogradsky Island, between the Little Neva and the Great Neva, stands the old fortress and prison of St. Peter and St. Paul, facing the Winter Palace, and containing the mint and the cathedral wherein the members of the imperial family are buried, also the arsenal.

The Chief Center.—The main part of Petrograd has for its center the Old Admiralty. Its lofty gilded spire and the gilded dome of St. Isaac's Cathedral are among the first sights caught on approaching Petrograd by sea. Three streets radiate from it, the first of them, the famous Nevsky Prospect. The street architecture, with its huge brick houses covered with stucco and mostly painted gray, is rigid and military in aspect.

A spacious square, planted with trees, encloses the Old Admiralty on three sides. To the east of it rise the magnificent mass of the Winter Palace, the Hermitage Gallery of Art, and the semicircular buildings of the general staff.

In the Petrogradsky Square is the well-known statue of Peter I. on an immense block of Finland granite. The richly decorated cathedral of St. Isaac of Dalmatia, erected by Nicholas I., is an almost cubic building (three hundred and thirty feet long, two hundred and ninety feet broad, and three hundred and ten feet high), surmounted by one

large and lofty and four small gilded domes.

In Nevsky Prospect are the Kazan Cathedral, the Public Library, the square of Catherine II., and the Anitchkoff Palace.

The aristocratic quarter lies between the line of the Nevsky Prospect and the River Neva.

The principal places of interest are: the Imperial or Winter Palace, the Hermitage, St. Isaac's Cathedral, the Kazan Cathedral, the Cathedral of Saints Peter and Paul, the Smolnoi Church, the Academy of Science, the House of Peter the Great; and, in the environs, Tsarkoe Selo, and Peterhof. For most travelers the greatest attraction in Petrograd is:

THE HERMITAGE.—It is connected with the Winter Palace, and was originally built by the Empress Catherine II. as a retreat. The present building, erected 1840-1852, by Klenze, is in the Greek style; it is a parallelogram, five hundred and twelve feet by three hundred and seventy-five feet, and for elegance of form as well as for beauty and costliness of materials employed has scarcely a rival in Europe.

Baedeker says: "The gallery of the Hermitage unquestionably stands among the first in Europe, not on account of its numbers (it boasts over one thousand nine hundred pictures) or on account of its completeness—the art of the fourteenth and fifteenth centuries and the entire German school is lacking—but because it possesses such a number of masterpieces from the best periods of the various schools, that for the Spanish masters it ranks next to the Prado and the Louvre, in French masters it is surpassed only by the Louvre, in Flemish artists it stands on a level with the principal galleries, and it is the premier collection of the Dutch school, especially Rembrandt."

CATHEDRAL OF ST. PETER AND ST. PAUL is in the fortress. It was erected 1714-1733, and was several times damaged by lightning. It has a beautiful spire, three hundred and two feet, the loftiest in Russia, except that at Reval. All sovereigns of Russia, including and since Peter the Great, except Peter II., who was interred at Moscow, lie buried here. The tomb of Peter the Great is near the south door. On the walls are many military trophies, keys of fortresses, flags, weapons, shields, etc. Nearby the Cathedral, in a brick building, is the boat of Peter the Great, preserved exactly as when it engaged the curious attention of Peter and so led to the creation of the Russian navy, of which it is facetiously called the "Grandfather."

THE KAZAN CATHEDRAL is situated upon the Nevsky Prospect, and is approached by a circular colonnade, in imitation of St. Peter's at Rome. In front are fine statues of Smolenskoi and de Tolly. The interior corresponds in its magnificence and display to St. Isaac's. The special object of interest is the image of "Our Lady of Kazan," which is covered with gems, the diamonds of the crown being of exceeding value. Around the cathedral are banners of important victories won by Russian arms and valor.

THE SMOLNOI CHURCH, at the eastern extremity of the city, is peculiarly rich in its effects, the entire structure and all its decorations being of

THE CATHEDRAL OF ST. ISAAC

The largest in Petrograd, was begun a century ago by Catherine II.; but was rebuilt in 1819-1858, by Montferrand, in the shape of a Greek cross. It is a simple but massive pile, with one hundred and twelve pillars in the four fronts. Those at the chief entrance are sixty feet high, and seven feet diameter—all round and highly polished granite monoliths from Finland. The dome, two hundred and ninety-six feet high, is surmounted by a golden cross and covered with copper, overlaid with gold. The Altar screen is of immense value and the entire edifice cost about fifty million dollars.

STATUE OF PETER THE GREAT, PETROGRAD

A very striking equestrian statue, erected by Catherine II. in 1782. It is of colossal size, by Falconet, and stands on a huge pedestal of granite, between St. Isaac's Church and the River Neva.

the purest white. In connection with this church is a celebrated seminary for young ladies of noble birth.

CATHEDRAL AND MONASTERY OF ST. ALEXANDER NEVSKY is at the extreme east end of the Nevsky Prospect. The buildings cover much ground, and include twelve churches, the monastery, and gardens. The Cathedral, which is that of the Metropolitan, dating from 1790, is enriched with marble and agate and paintings—the altarpiece, the Anunciation, is by Raphael Mengs. On pillars opposite the altar are large portraits of Peter the Great and Catherine II. The shrine of St. Alexander Nevsky is of silver, about two thousand pounds of the metal being used in the whole; near the tomb are suspended the keys of Adrianople. The Monastery has a rich collection of jeweled mitres, gold brocaded vestments, and a mass of valuables, also many objects of interest, including the crown of St. Alexander and the bed on which Peter the Great died.

TSARSKOE SELO (*tsär'-kō-ye sā'lō*), about fifteen miles south of St. Petersburg, contains a famous imperial palace, a favorite summer residence of the court. The Old Palace, begun in 1744, is richly decorated, the walls of one room are incrusted with amber, those of another with lapis lazuli. The magnificent marble gallery, two hundred and seventy feet long, connects the palace with a detached building. The park is full of caprices, such as a Chinese tower and village, an Egyptian pyramid, a Turkish kiosk, and the so-called doll-houses of the royal princesses.

PETERHOF (*pā'ter-hōf*), near Oranienbaum, was begun in 1720, and built by Leblond for Peter the Great. A marine palace, with a long front, made to retain its original appearance, even its ancient yellow color has been continually renewed. It contains porcelain, malachite, tapestry, paintings of victories in the reign of Catherine II., and a collection of three hundred and sixty-eight portraits of women, painted by Count Rosali for the empress during a journey. All are in the national costume. The gardens are full of Neptunes and Tritons and good fountains. The well-wooded park has many curiosities:—Marli, a favorite resort of Peter the Great; the cottage of the Empress Catherine, brilliant with gold and mirrors; the Palais de Paille; the English Garden, with a ball-room.

MONUMENT TO NICHOLAS I., PETROGRAD

THE HERMITAGE OR MUSEUM OF ART,
connected with the Winter Palace, is one of most famous in Europe and contains one thousand seven hundred painting of all schools, among them being some by Murillo, Velasquez, Rubens, Van Dyke, Rembrandt, and Ruysdael.

Moscow (*mŏs'kō*), the ancient capital of the Russian Empire, is one of the most magnificent and interesting cities of the world. The city is gathered in a semi-circle around the citadel, or Kremlin, which stands immediately upon the river bank. The streets are exceedingly irregular, though generally presenting the appearance of broad, well-paved avenues of a modern European city. The innumerable white, semi-oriental structures which greet the vision from every commanding point, with their unnumbered domes, spires, belfries, towers, and minarets, give to the city a magnificence of beauty scarcely to

be found elsewhere in the great cities of Europe.

THE KREMLIN.—The historic, as well as the most interesting part of the city, is within the walls of the Kremlin. It is associated with much that is held in deepest reverence by Russians—here the imperial power receives religious consecration, and the great bell of Ivan Veliky proclaims the new monarch. The Kremlin is an assemblage of many buildings, covering quite a section of the city—churches, palaces, arsenals, barracks, monuments—enclosed within a brick wall about a mile and a half in circuit. Upon the wall, which is sixty feet high, are twenty-one towers. The principal gate, the Gate of the Saviour, is on the east side. Over the passage of the gate is the venerated "Saviour" brought from Smolensk in 1685, and it is the custom for the passer-by to uncover his head.

THE TOWER OF IVAN VELIKY, or John the Great, built in 1600, and three hundred and twenty feet high, contains thirty-four bells, the largest of which weighs sixty-four tons. When all these bells are rung together at Easter the effect is wonderful. At the foot of this tower is the vast Tsar Kolokol, or Monarch of Bells. It once hung in a tower (burned in 1737), weighs four hundred and forty-four thousand pounds, and is twenty feet high and sixty feet round. The value of the metal in the bell is nearly two million dollars.

Outside the Kremlin is the Chinese town, so-called, founded by Helena. Here are the Romanoff Palace, the Iberian Gate and Chapel, the University, the great Riding School, the Theaters, and the largest Bazaar in Russia, except that of Nijni-Novgorod.

THE CHURCH OF THE SAVIOUR, is conspicuous near the river, a quarter mile southwest of the Kremlin. This beautiful church, by the architect Thon, was erected 1837-1883, at a cost of more than eight million dollars. It has five cupolas, the principal being about one hundred feet in diameter; many figures in relief of patriarchs and saints upon the facade. The interior is elaborately decorated with marble and gilding; upon the walls are tablets relating to military events, admirable paintings and sculpture.

THE CATHEDRAL OF ST. BASIL, erected 1554-1557, is a remarkable edifice, consisting of eleven chapels with as many cupolas, all different, but wonderfully proportioned.

Valdivostok (*vlä-dē-vōs-tok'*), capital (since 1903) of the vice-royalty of Eastern Asia, Siberia, is situated on the east shore of Amur Gulf. It has one of the finest harbors in the world, is a naval station, has an arsenal, and is a terminus of the Siberian railroad. It escaped attack during the Russo-Japanese war, but suffered from naval mutiny and unrest in the Russian disturbances of 1905-1906. Its climate is severe—the average annual temperature being only orty degrees Fahrenheit.

HISTORY OF RUSSIA

The races who peopled Russia were vaguely known to the ancients as Scythians, and their country as Sarmatia. It received its name from the *Ruotsi* or *Russ*, a tribe of Norse "rovers" or freebooters, who entered the country from the west about the eighth century. The name was later applied to the realm of Moscow, and modified to Russia.

Early Traditions.—Three brothers, Rurik, Sineus, and Truvor, Scandinavians, were invited, according to tradition, to come and protect territory in northwest Russia against the Finns and the Lithuanians. They and their successors built new forts, and took part in wars. The times of the "Sunny Vladimir" (980-1015) are the "heroic" epoch of early Russian history, and the feats and feasts of Vladimir and his "war companions" have been handed down through ages in legend and song; while his conversion to Christianity made him the hero of the annals written by monks.

Kieff the First Historic Center.—The first half of the eleventh century, during which Yaroslaff the Wise was grand prince at Kieff, was the most brilliant time for Kieff, then the "mother of the Russian towns." The great cathedral of St. Sophia was built at that time; schools were opened, and the first written Russian law was compiled. At his death (1054) Yaroslaff was ruling over most of the Russian towns.

The next two centuries of Russian history correspond to the feudal period of Western Europe. The Russians at that time were steadily extending their territory toward the east; they colonized the Oka, the Don, and the Finnish territories in the northeast.

Settlements in and about Moscow.—Owing to the gradual colonization of the basin of the Oka and the upper Volga, a new Russian territory had grown in importance in the meantime. Suzdal and Rostoff were its chief centers. It differed from southwest Russia in many respects. Its inhabitants were Great Russians—a hard-working race, less poetical and less gifted, but more active than their southern brethren. Besides, a good many of its inhabitants were peasants, settled on the lands of the boyars, and the cities themselves, being of recent creation—like Vladimir and, later on, Moscow—had not those traditions of independence which characterized Kieff or Novgorod. It was therefore easier for the authority of the prince to develop in the northeast, under the guidance of the church and the boyars.

The first Suzdal prince, Andrei Bogolubsky (1157-1174), was the first representative of that policy. He invited many Kieff boyars to settle in the land of Suzdal, and finally he took and burnt Kieff (1169).

The supremacy of Kieff was thus destroyed, and the land of Suzdal became the Ile-de-France of Russia—the nucleus of the future Russian state. The Suzdal land continued to grow and to enjoy prosperity during the next fifty years; economical, educational and literary progress were marked, and the Russian territory extended farther eastward.

Tartar Invasion.—But in the thirteenth century a great calamity visited Russia: a Mongol invasion suddenly put a stop to the development of the country and threw it into a totally new direction.

The Tartars first appeared in 1224, but their real conquest, under Batu Khan, was made in 1238 and the years immediately following. They subdued all the little Slav states except the republic of Novgorod. Latterly the rulers or princes of Moscow gained an ascendency over the other states, and formed the nucleus of a central sovereignty.

Ivan III. Expels the Tartars.—The Tartar supremacy lasted till about 1480, when Ivan III. (1462-1505) succeeded in throwing off their yoke. He did much to consolidate and extend his kingdom, and conquered Novgorod in 1478. The reign of Ivan IV. "The Terrible" (1533-1584) is of great importance. In 1547 he assumed the title of Czar or Tsar, a variant of Cæsar. He conquered Kazan and Astrakhan, and the conquest of Siberia was begun in his reign. The epithet "terrible" has reference to his cruel persecution of the boyars, a kind of powerful baronial class.

House of Romanoff Established.—The accession of the still-reigning Romanoff house took place in 1613 when the States-General elected Michael Romanoff as ruler. Under Alexei (1645-1676), son of Michael, territory was won from Poland, the Cossacks of the Ukraine had to submit, and the power of Russia greatly increased. The reign of Alexei's son, Feodor III. (1676-1682), witnessed a war with Turkey, but was signalized by many important reforms. His imbecile brother Ivan was heir apparent, but Feodor willed the throne to his half-brother Peter, known in history as the Great; but Peter only obtained sole power in 1689 after overthrowing Sophia, Ivan's sister.

Under Peter the Great.—Peter the Great opened what may be called the European period of Russian history. (See Peter the Great.) He made his country a European state. He gave it a standing army, a navy on the Baltic, the embryo of a modern administration, a diplomatic service, and a financial organization. He made canals, encouraged industry, literature and art. The heart of Russia might remain at Moscow, but henceforth it was to have also a head that looked out westward from the Neva.

On the other hand, Peter increased taxation; his cruelty was oriental, and serfdom under him became more and more extensive.

He completed the conquest of Siberia, waged successful war with Charles XII. of Sweden, and by the treaty of Nystad in 1721 obtained Esthonia, Livonia, Ingermannland, and part of Finland, thus gaining a large maritime territory on the Baltic Sea. He founded Petrograd in 1703, and made it the capital in place of Moscow.

The Eighteenth Century in Russian history is a century of empresses. Peter the Great was succeeded by his wife, Catherine I. (1725-1727). A grandson of Peter the Great, Peter II., followed Catherine, reigning from 1727 to 1730. The next sovereign was Anna (1730-1740), whose reign was a period of German influence. Ivan VI. (1740-1741) was soon displaced by the anti-German party, and Elizabeth (1741-1762), daughter of Peter the Great, ascended the throne. A part of Finland was obtained by the treaty of Abo, and Russia took part against Prussia in the Seven Years' war. The first Russian university, that of Moscow, was founded in 1755.

The death of Elizabeth and the accession of Peter III., in 1762, greatly relieved the hard-pressed Frederick the Great, because Peter at once reversed the Russian policy.

Catherine II.—In July, 1762, he was deposed by his wife, Catherine II. (1762-1796), whose reign is of great importance in the progress of Russian power.

Under Catherine II. successful wars were carried on against Turkey, Persia, Sweden and Poland, which largely extended the limits of the empire. The acquisition of the Crimea, which gave Russia a firm footing on the Black Sea, and the first partition of Poland, were two most important steps toward the consolidation of the empire.

Napoleonic Period.—Catherine's son and successor, Paul I. (1796-1801), at first, through apprehension of the revolution in France, joined the Austrians and British against France, but soon after capriciously withdrew, and was about to commence war with Great Britain when his assassination took place. A palace conspiracy put an end to his reign and life.

His eldest son, Alexander I. (1801-1825), was at the outset desirous of peace, but was soon drawn into the vortex of the great struggle with France, in which he played a prominent part. (See Alexander I. and Napoleon.) The Holy Alliance and the example of conservative policy set by Austria exercised a pernicious influence on the later part of his reign; and the higher classes, who had looked for the introduction of at least a portion of the liberal institutions they had seen and admired in Western Europe, became so dissatisfied that, when his youngest brother, Nicholas I. (1825-1855), from whom they had nothing to hope, succeeded, they broke out into open rebellion, which was speedily crushed.

The Turkish Wars.—A full stop was now put to the intellectual development of Russia. Wars were declared with Persia and Turkey; and a long and deadly struggle commenced with the Caucasian mountaineers. The cession of Erivan and Nahitchevan by Persia, of the plain of the Kubañ, of the protectorate of the Danubian principalities, and of the free right of navigation of the Black Sea, the Dardanelles, and the Danube by Turkey only induced him to further prosecute his aim of conquering for Russia a free issue from the Black Sea in the Dardanelles.

In 1830 he converted Poland into a Russian province; in 1849 he aided Austria in quelling the insurrection of the Magyars; and in 1853 he began a war with Turkey which became the Crimean war, and in which, though the allies, Great Britain, France and Sardinia, did not obtain any decided success, Russia suffered immense loss.

Alexander II.—The accession of Nicholas' son Alexander II. (1855-1881)—one of whose first acts was the conclusion of the peace of Paris (1856), by which Russia lost the right of navigation on the Danube, a strip of territory to the north of that river, and the right of keeping a navy in the Black Sea—was the signal for a general revival of intellectual life in Russia. Obligatory military service for all Russians was introduced in 1874.

The insurrection in Poland was suppressed with extreme severity, and in 1868 the last relics of Polish independence disappeared in the thorough incorporation of the kingdom with the Russian Empire. The subjugation of the Caucasus was completed in 1859.

Russian supremacy was established over all the states of Turkestan. In 1876 the administration of the Baltic provinces was merged in that of the central government; but the autonomy of Finland was respected and even extended.

Russo-Turkish War of 1877-1878.—In 1877 the Russo-Turkish war broke out. At first the Russian progress was rapid; but the energy displayed by the Turks during the summer, and the resolute defense of Plevna by Osman Pasha from July till December, checked the progress of the Russian army. During the winter, however, she crossed the Balkans, and her vanguard, reaching the Sea of Marmora, stood in view of Constantinople. The armistice signed in January, 1878, was followed in March by the treaty of San Stefano; and after diplomatic difficulties that seemed for a time not unlikely to issue in war between Russia and Great Britain, a Congress of the Great Powers met at Berlin in June, 1878, and sanctioned the cession to Russia of the part of Bessarabia given to Moldavia in 1856, as also of the port of Batoum, of Kars, and of Ardahan.

Rise of Nihilism.—The growth of revolutionary discontent, leading to severe repressive measures, was marked by several murders of high officials, and on March 13, 1881, Alexander II. was killed by the revolutionists.

Reactionary Reign of Alexander III.—The reign of Alexander III. (1881-1894) was in the main characterized, in contrast to the liberal reforms of the last reign, by reactionary steps. Press freedom disappeared completely, and the universities were again suppressed. The Dumas, or representative assemblies, were deprived of all real independence in 1892. Alexander II.'s judicial reforms were partly undone, and the village communities, known as mirs, were brought under the more direct control of the land-owners. Russification was vigorously pursued in Poland and the Baltic provinces, and in 1890 the first steps toward the Russification of Finland were taken.

Alexander III. was not friendly to Germany, but avoided hostilities more serious than those of a tariff war, although the Bulgarian crisis of 1885 subjected their relations to a severe strain. Russia and France now began to draw close together, but a Franco-Russian alliance was not officially admitted till 1896-1897, and its terms were secret. Merv was annexed in 1884, and the occupation of Penjdeh in 1885 nearly led to war with Great Britain. Alexander III. escaped several attempts at assassination, and died of disease in November, 1894.

Russia in the Far East.—After the reign of Alexander III. comes the fateful reign of his son, Nicholas II. In 1896 China granted permission to carry the Siberian railway (begun in 1889) through Manchuria to the far eastern Russian seaport of Vladivostok. In December, 1897, in consequence of the Germans having acquired Kiauchau from China, Russia occupied Port Arthur, and in the following year obtained from China a lease of it and some neighboring territory, although in 1895 she had taken the chief part in preventing Japan from taking it as a prize of victory. She shared in the international expedition to China in 1900, and herself suppressed risings in Manchuria with the utmost cruelty. Professing to be ready, and even anxious to evacuate Manchuria as soon as possible, she was preparing for virtual annexation; but her aggressive action in Korea aroused Japanese opposition, and led to the war of 1904-1905.

By treaty of Portsmouth (1905), which ended this war, Russia lost—for the time being at least—all influence in Manchuria, Korea, and China, and had to cede to Japan Port Arthur and its territory, and also southern Sakhalien.

The Imperial Duma.—In August, 1905, the czar issued a manifesto ordering the election of an Imperial Duma or Parliament. Count Witte was made president of a reorganized Council of Ministers, with instructions to form a reform cabinet. The general strike in Finland compelled the czar to restore Finland's constitution and liberties previously taken away in 1903. The bureaucrats attempted to discredit the reform movement by instigating attacks on Jews, and other outrages, especially in Odessa, where the authorities permitted appalling atrocities.

The Imperial Duma, promised in 1905, was duly elected early in 1906, and held its first meeting on May 10 at Petrograd. It was dissolved later in the year because too liberal, and a second one, elected in 1907, met the same fate. By various devices the government managed to get a less advanced Duma elected late in 1907, which did some useful work in 1908. An important Anglo-Russian convention was signed in 1907, the signatories agreeing to respect the territorial integrity of Thibet and the suzerainty of China. Other conventions were signed (1910) between Russia and Japan respecting the status of Manchuria, and between Russia and Germany in 1911.

After declaration of war by Austria against Servia in 1914, Russia announced that her support would be given to Servia. Consequently Russia joined France and Great Britain in the conflict that followed. (See further under European war.)

Books of Reference.—Wallace's *Russia;* Leroy-Beaulieu's *The Empire of the Tsars;* Norman's *All the Russians;* Drage's *Russian Affairs;* Suvorin's *All Russia—a Directory of Industries,* etc.; Stepniak's *King Log and King Stork;* Krapotkin's *Memoirs of a Revolutionist;* Morfill's *Russia;* Villari's *Russia under the Great Shadow;* Wellesley's *With the Russians in Peace and War;* Ganz's *The Downfall of Russia;* Milyoukov's *Russia and Its Crisis;* Meakin's *Russia, Travels and Studies.*

SOVEREIGNS OF RUSSIA

A long list of dukes and grand dukes preceded the actual foundation of the Russian monarchy under the rule of a czar.

HOUSE OF RURIK

This royal house includes the descendants of Rurik, Grand Prince of Novgorod, the reputed founder of the Russian royalty. It became extinct in the person of Feodor in 1598.

1462-1505.—Ivan (Basilovitz), or John III., took the title of czar, 1482; Grand Duke of Moscow.

1505-1533.—Vasali IV., or Basil V., obtained the title of Emperor from Maximilian I.; son of Ivan the Great.

SOVEREIGNS OF RUSSIA—Continued

1533-1584.—Ivan IV. the Terrible; a tyrant; son of Vasily IV.
1584-1598.—Feodor, or Theodor, I.; and his son Demetrius, murdered by his successor; son of Ivan the Terrible: was elected to the throne.
1598-1604.—Boris-Godonof, who usurped the throne.
1605.—Feodor II., murdered.
1606.—Vasali-Chouiski, or Zouinski.
1606-1610.—Demetrius the Impostor, a young Polish monk; pretended to be the murdered prince Demetrius; put to death.
1610-1613.—Ladislaus of Poland; retired 1613.

HOUSE OF ROMANOFF—MALE LINE

1613-1645.—Michael-Feodorovitz, of the house of Romanoff, descended from the czar Ivan Basilovitz; unanimously elected czar.
1645-1676.—Alexis, styled the father of his country; son of Michael Feodorovitch.
1676-1682.—Feodor, or Theodor, II.; eldest son of Emperor Alexis.
1682-1689.—Ivan V.; Peter I., Ivan was the half-brother of Peter the Great, in whose favor he resigned.
1689-1725.—Peter I., the Great, alone; took the title of emperor October, 1721; founded St. Petersburg; son of Alexis.
1725-1727.—Catherine I., his widow, at first the wife of a Swedish dragoon, said to have been killed on the day of marriage; was married to Peter the Great in 1707.
1727-1730.—Peter II., son of Alexis Petrovitz, and grandson of Peter the Great; deposed.

HOUSE OF ROMANOFF—FEMALE LINE

The reign of the next three sovereigns of Russia, Anne, Ivan VI., and Elizabeth, of the female line of Romanoff, formed a transition period, which came to an end with the accession of Peter III., of the house of Holstein-Gottorp.

1730-1740.—Anne, duchess of Courland, daughter of the czar Ivan.
1740-1741.—Ivan VI., an infant, grand-nephew to Peter the Great; immured in a dungeon for eighteen years; murdered in 1764.
1741-1762.—Elizabeth, daughter of Peter the Great reigned during Ivan's captivity.

HOUSE OF ROMANOFF—HOLSTEIN.

All the subsequent emperors, without exception, connected themselves by marriage with German families. The wife and successor of Peter III., Catherine II., daughter of the Prince of Anhalt Zerbst, general in the Prussian army, left the crown to her only son Paul, who became the father of two emperors, Alexander I. and Nicholas, and the grandfather of a third, Alexander II. All these sovereigns married German princesses, creating intimate family alliances, among others, with the reigning houses of Württemberg, Baden, and Prussia.

1762.—Peter III., son of Anne and of Charles Frederick, duke of Holstein-Gottorp; deposed, and died soon after; supposed to have been murdered. Son of Charles Frederick, Duke of Holstein.
1762-1796.—Catherine II.; a great sovereign; extended the Russian territories on all sides; died 1796; wife of Peter III.
1796-1801.—Paul, her son; murdered, 1801; son of Peter III.
1801-1825.—Alexander I., died 1825; son of Paul.
1825-1855.—Nicholas I.; died 1855; third son of Paul.
1855-1881.—Alexander II., assassinated at St. Petersburg, March, 1881; son of Nicholas I.
1881-1894.—Alexander III.; died 1894; married Mary (formerly Dagmar), princess of Denmark; son of Alexander II.
1894-1917.—Nicholas II., son of Alexander III.; abdicated 1917 upon overthrow of the monarchy.

SECONDARY POWERS OF EUROPE

BELGIUM (Fr. *Belgique*), one of the smaller European states, consists of the southern portion of the former kingdom of the Netherlands (as created by the Congress of Vienna), lying between France and Holland, the North Sea and Rhenish Prussia. Its greatest length from northwest to southeast is one hundred and seventy-three miles; and its greatest breadth from north to south one hundred and five miles.

Surface.—Belgium is, on the whole, a level, and even low lying, country; diversified, however, by hilly districts. The north and west of the country is low and level plain, like Holland, but the undulating forest plateaus of the Ardennes cover all the south and east, rising near the frontier in that direction to a height of two thousand feet above the sea. The Campine, composed of marshes, coal-bearing heaths, and irrigated lands, extends along the Dutch frontier. In Flanders dykes have been raised to check the encroachments of the sea.

Rivers.—The land slopes generally northward, and this is the direction of the numerous rivers and streams which water it. The great river of the country is the Meuse, which enters from France and passes out into Holland, being navigable all through Belgium. Its tributary, the Sambre, from France, which joins it on the left near the center of the country, is also a navigable stream; and the Ourthe, from the frontier of Luxemburg, which joins it lower down on the right, is navigable for half its course. The Escaut or Scheldt is the main river of the lowland in the west, and with its chief tributaries, the Lys on the left and the Rupel on the right, forms the waterway of the plain. These rivers and important tributaries, with canals make up one thousand four hundred miles of waterways.

Climate and Landscape.—Belgium has a climate which resembles that of England, opposite to it in the same latitude, but which is more excessive. The lowland of the north is foggy and damp, like Holland; the higher country south and east has clearer skies.

People.—Belgium is one of the most densely peopled countries of the world, only equaled in this respect by some parts of the plain of China, or of the valley of the Ganges in India, a result which is no doubt due to the combination of natural facilities for agriculture, manufactures, and trade, within its limits. The Flemings (of Teutonic stock) and Walloons (Celtic in origin) speak each their own dialects of Dutch and French; there are also numbers of Germans, Dutch, and French. East and West Flanders, Antwerp, and Limburg are almost wholly Flemish, and Brabant mainly so. The line between the Flemish and Walloon districts is sharply defined, the Flemish part being the richest and most cultivated. The French language has gained the ascendancy in educated society and in the offices of government, but the Flemish dialect prevails numerically in the proportion of nine to eight.

PALACE OF JUSTICE, OR PARLIAMENT BUILDINGS, AT BRUSSELS

Religion and Education.—Almost all the inhabitants of Belgium are Roman Catholics, though complete liberty and social equality is allowed to all religious confessions. Education is not yet generally diffused through the population, and was, until recently, almost entirely in the hands of the Roman Catholic clergy. There are state universities at Ghent and Liege, an independent liberal university at Brussels, and a Catholic university at Louvain.

Products and Industries.—About a fourth of all the inhabitants of Belgium are occupied in agriculture. Besides wheat, rye, and oats, hops are cultivated on a large scale, for export chiefly to France and England. Beetroot for the sugar factories, of which there are over a hundred in the country, is also a large crop, and flax is largely grown in the Flemish lowlands.

Two great coalfields extend across the central part of the country from west to east, along the valleys of the Meuse, but Belgium is essentially a manufacturing country, and it is largely dependent upon foreign supplies for its food. The mineral kindgom yields, beside coal, iron, zinc, lead and copper. The leading industries are collieries, quarries, and metal, glass, textiles, lace, flour and starch mills, sugar, distilleries, breweries, etc.

Government.—On the re-arrangement of European affairs, after the fall of Napoleon, Holland and Belgium were formed into the ill-assorted kingdom of the Netherlands under the family of Orange. The differences between the northern and southern divisions in race and language, in history, religion, and customs, proved too great.

In 1830 Belgium separated from Holland, and her neutrality was guaranteed by a conference of the European Powers, and by a further treaty, in 1839, signed by Austria, France, Great Britain, Prussia, the Netherlands, and Russia.

The Belgium constitution of 1831 jointly vests the legislative power in the king, the Senate, and the Chamber of Representatives. The one hundred and ten senators (with the exception of twenty-seven elected by the provincial councils) and one hundred and sixty-six representatives are elected by the people, the former for eight, the latter for four years. Universal male suffrage, with plural voting up to three votes by property and educational qualifications, was introduced by the electoral law of 1894, proportional representation being secured by an act of 1900. There are in addition representative Provincial and Communal Councils.

Cities.—Brussels, population, 1910, with suburbs, 720,347 inhabitants, is the capital. Other towns with over 100,000 inhabitants are Antwerp, the chief port (320,650 exclusive of suburbs); Ghent (165,149), the center of the iron industry, which has also large cotton and flax spinning mills, and is the second port of importance after Antwerp, while its flower shows are famous; and Liège (174,768).

Its great harbor and commercial city is Antwerp, a strongly fortified city on the Scheldt. The other harbors are Ghent, Bruges, Ostend, Nieuport, Blankenberg, and Zeebrugge.

Antwerp, the principal fortress, and Liège and Namur, also fortified, were designed to afford military protection on the line of the Meuse against a violation of neutrality by either France or Germany.

Brussels (Fr. *Bruxelles*), the capital of Belgium, is situated in a fertile plain on the ditch-like Senne, twenty-seven miles south of Antwerp, and one hundred and ninety-three miles northeast of Paris. It has a circumference of about five miles, and is built partly on the side of a hill. Though some of the streets are so steep that they can be ascended only by means of stairs, Brussels may on the whole be pronounced one of the finest cities in Europe.

The fashionable Upper Town, in which are the royal palace, public offices, and chief hotels, is much more healthy than the older Lower Town, which is greatly subject to fogs, owing to its intersection by canals and the Senne, although the stream now passes under an arched covering, which supports a boulevard. But the closely built old streets, with their numerous handsome buildings, formerly belonging to the Brabant nobility, and now occupied by successful merchants and traders, have a fine picturesque appearance, while some of the public edifices are unrivaled as specimens of Gothic architecture.

French is spoken in the upper division; but in the lower Flemish is the current language prevalent, and by many the Walloon dialect is spoken.

The walls which formerly surrounded Brussels have been removed, and their place is now occupied by pleasant boulevards extending all around the old town, and shaded by alleys of limes. The *Allée Verte*—a double avenue along the Scheldt Canal—forms a splendid promenade, and leads toward the country palace of Laeken, three miles north of the city.

THE TOWN HALL, OR

Hôtel de Ville, in Grande Place, near the center of the city, 1402, is regarded as architecturally one of the finest structures in Europe. Its tower rises to the height of three hundred and seventy feet, and is placed somewhat to one side of the center of the building.

Besides the fine park of thirty-two acres, in the Upper Town, ornamented with fountains and statues, and surrounded by the palace and other state buildings, Brussels has several other squares or places, among which are: the *Place Royale*, with its colossal monument of Godfrey of Bouillon; the *Grande Place*, in which is the hôtel-de-ville, a splendid Gothic structure of the fifteenth century, with a spire of open stonework three hundred and sixty-four feet high; and the *Place des Martyrs*, where a memorial has been erected to those who fell here in the revolution of 1830. The statue group of the Counts Egmont and Horn is notable. The cathedral of St. Gudule, dating from the thirteenth century, has many richly painted windows, and a pulpit considered to be the masterpiece of Verbruggen. The *Palais des Beaux Arts* contains the finest specimens of the Flemish school of painting and a sculpture gallery. The Royal Library adjoining has half a million volumes.

The *Palais de Justice*, built in 1866-1883 at a cost of more than ten million dollars, is one of the most magnificent buildings in Europe, dominating the lower town from the terraced slope of the upper town. The Royal Palace and the National Palace (for the chambers) are important buildings. Besides the University, there are schools of painting and sculpture, and a conservatory of music.

Brussels lace is particularly famous. Of the so-called Brussels carpets only a few are manufactured here, most of those of Belgian make being produced at Tournai. There are also manufactures of damask, linen, ribbons, embroidery, paper, jewelry, hats, soap, porcelain, carriages, etc.

History.—The history of Belgium as a kingdom can be said to date only from the time of the Congress of Vienna, in 1830, but its history as part of the Netherlands goes back to the time of the Romans.

The province of Belgica under the Romans passed under the sway of the Franks, and fell later to the Burgundian princes. On the death of Charles the Bold in 1477 it passed by marriage to the House of Hapsburg. The Spanish Netherlands remained (unlike the northern provinces which rebelled against Spain and became a Protestant republic) under the Spanish branch of the Hapsburgs, till in 1713 they were transferred to Austria. From 1794 Belgium was under French sway, but on the fall of Napoleon was united with the kingdom of the Netherlands. It rebelled in 1830, and since then, as above stated, has had a separate career as a limited constitutional monarchy. Again, in 1838, Holland and Belgium seemed on the brink of war, the cause being that Belgium had treated Lembourg and Luxembourg, which by the convention had been given to Holland, as if they were in reality a part of its territory. The crisis was terminated by the action of the Great Powers, who reduced Belgium's share of the national

debt of the Netherlands, and partitioned the territories again in dispute. The tranquillity of the country was again disturbed by the revolutionary spirit of 1848, but after 1850 the constitutional party began that series of reforms which gained for Belgium the position of one of the freest countries in Europe.

The question of Luxembourg threatened in 1861 the peace of Europe, and Belgium took part in the congress which prevented war breaking out. In 1870, on the outbreak of hostilities between France and Germany, Belgium, fearing invasion, mobilized her troops, but her neutrality was recognized and left inviolate by both parties. In 1885 the Congo Free State was acknowledged to be under the presidency of the king of Belgium, Leopold II., who had succeeded his father in 1865. The management of the colony gave cause for much bitterness, and led to a number of scandals. Leopold II. died in 1910, and was succeeded by his nephew, King Albert.

On August 2, 1914, the neutrality of Belgium was violated by the invasion of the German army at Visé, on the ground of *military necessity*. The German forces met with the most stubborn resistance from the valiant though numerically inferior Belgians at Liège and Namur. The country was subsequently completely overrun by German armies and subjected to military control. The Germans were in occupation of practically the whole country down to the armistice between the belligerent powers signed November 11, 1918. King Albert re-entered the Belgian capital November 22, 1918.

BULGARIA, a monarchy in the northeast part of the Balkan Peninsula between the Danube and the Balkans, was created a principality by the treaty of Berlin in 1878, greatly extended by the incorporation of East Rumelia in 1885, and declared an independent kingdom in 1908.

The net result of the wars of 1912-1913 was the increase of Bulgarian territory from 33,600 square miles to about 45,000. The population increased by about 500,000, was in 1910 4,337,513—over three-fourths Bulgarians, 465,000 Turks, 121,000 Gypsies, 80,000 Roumanians, 43,000 Greeks, and 40,000 Jews. The Bulgarians now extend into Macedonia, Bessarabia, etc., their total number being about 8,000,000.

Surface.—The north of Bulgaria is fertile plain and hilly country; the south is wooded and mountainous. The country has a fine waterway on the northern boundary, a Black Sea and Ægean seaboard, a mild climate, an agricultural country capable of much, an abundance of iron and some coal, free institutions, a peasantry possessing the solid qualities and persevering industry of northern races, and an assured economic development.

Productions.—The chief occupation of the people is agriculture, which engages about seventy per cent of the population. Cereals (wheat, maize, rye, barley, oats) are the principal crops, and rank first among the exports. Wine is produced everywhere, especially near the Black Sea. Roses are cultivated to a large extent, especially round Kazanlik and Karlavo and on the north side of the Rhodope Mountains for attar of roses, which is largely exported. Silkworms are bred in Philippopolis and Haskaro. Tobacco is carefully cultivated. There is little industry apart from domestic branches such as native cloth, carpets, trimmings and ribbons; but there is some brewing and distilling, leather work at Sumen, copper work, and pottery-making. The chief exports are grain, live stock, butter, eggs, hides, and attar of roses, sent chiefly to Turkey, France, Great Britain, and Austria-Hungary.

People.—Education has been very zealously and steadily promoted. Elementary education is compulsory. There are few technical schools. Sofia has a university.

COLUMN OF THE CONGRESS, BRUSSELS

It is in Place du Congrès, two squares north from the Cathedral was erected, 1850, in honor of the adoption, in 1831, of the present Constitution of Belgium. This is surmounted by a statue of the king. At the corners are allegorical figures of Liberty.

The old Bulgarian Slavonic tongue is closely allied to the great Russian, but some Servian, Greek, Romanic, Albanian, and Turkish elements have found their way into the language.

The Orthodox Greek Church counts seventy-seven per cent as its adherents, Islam twenty-one and one-half per cent, and the others are Jews.

Government.—Bulgaria possesses one of the freest and most democratic constitutions in Europe, largely modeled on the lines of the Belgian constitution, except that there is no second chamber; and election of the *Sobranje* or National Assembly is by universal manhood

STREET SCENE IN SOFIA, CAPITAL OF BULGARIA

This modern city is quite American in its appearance. It typifies to Bulgarians the progress of their nation, and is substantial and practical rather than pleasing. The streets are broad, straight, electrically lighted, and well paved, while the houses in the newer sections are modern structures of dignified architecture. While Sofia may not impress the visitor with its beauty, it does impress him with the fact that there is a good deal of common sense and business efficiency in this part of the Balkans.

suffrage, in the proportion of one member to every twenty thousand of the population. The executive power is vested in eight ministers nominated by the king. The monarchy, independent since 1908, is hereditary.

Cities.—The chief towns of Bulgaria are Sofia, Philippopolis, Rustchuk and Varna. Varna and Burgas are ports on the Black Sea, Dedeagatch on the Ægean.

Sofia (*sofee'a*), the capital since 1878 of Bulgaria, stands in a broad valley of the Balkans, on the railway from Constantinople to Belgrade and Vienna. It lies two hundred and six miles northwest of Belgrade, while Constantinople lies three hundred miles southeast. The valley at Sofia is an upland plateau, seventeen hundred feet above sea level, and near the heart of the peninsula, between the Vitosha Mountains and the main Balkan chain. At the end of almost every vista in the city are the distant hill masses, and fringing mountains.

The city early became important as a trade center, and probably would have developed into one of the great cities of Europe had not periodical destruction, almost continual dangers of war, and centuries of misrule held it back.

The rebuilding of Sofia began around 1880. It now has many creditable public buildings, electric lighting, an electric street railway and good sewerage and water systems.

It possesses the largest theater in southeastern Europe. The Bulgarian National Theater, with a competent corps of actors and singers, and offering the best in opera and drama, is a revelation of the strides that have been made in the Balkans since the Turks were driven back a brief generation ago. The theater is a handsome modern structure, planned with greater luxury of detail than most buildings in Sofia, and it cost four hundred thousand dollars.

Sofia has a public bathhouse which is one of the finest buildings of its kind in the world. It was built over a hot mineral spring, famed since the days of the Romans. This building, in Byzantine style, including in its interior appointments all of the most modern luxuries, cost the Bulgarians six hundred thousand dollars.

Their capital city is one of the peculiar prides of the hard-working, long-enduring, persistent Bulgarians. It typifies to them the promise of a great Bulgarian future, and they also look upon it as an earnest of their right to a respected place among the civilized nations of the West.

History.—The country now known as Bulgaria was originally inhabited by Thracians, and under the Romans formed the province of Mœsia. The Bulgars originally came from the banks of the Volga and crossed the Danube in the sixth century, and occupied the East. They overcame the Slavs, adopted their language and customs, and thus became a great Slav power; but by 1186 they had split up into three principalities, and from 1393 fell under the domination of the Turks. For close upon five hundred years the Bulgars were subject to the rule of the Ottoman Empire.

The first national awakening dates from the year 1762, when the monk Paysios, then at Mt. Athos, wrote the national chronicles, and revived memories of ancient glory. A new national literature began; the first Bulgarian school was opened in 1835, and was followed by others. A newspaper appeared in 1844. The Crimean war stirred up Slavonic sympathies which Russia sedulously and naturally cherished. In 1872 the Bulgarian Church and archbishop became again independent of the supremacy of the Greek patriarch.

In 1877 Russia, as guardian of the Slav races of Turkey, declared war. As a result of the war, Bulgaria was created by the treaty of Berlin, July 13, 1878, and in 1885 Eastern Rumelia was added to the newly created principality. In 1908 the country was declared to be an independent kingdom. In 1912-1913 a successful war of the Balkan League against Turkey increased the size of the kingdom, but in August, 1913, a short campaign against the remaining members of the League reduced the acquired area, and led to the surrender of about two thousand square miles to Roumania. In October, 1915, Bulgaria decided to participate in the European conflict, and sided with Germany, Austria-Hungary, and Turkey, and attacked Servia.

NEW QUARTERS OF COPENHAGEN, CAPITAL OF DENMARK

DENMARK, the smallest of the three Scandinavian kingdoms, consists of the peninsula of Jutland and a group of islands in the Baltic, and is bounded by the Skager-Rak, the Cattegat, the Sound, the Baltic, the Little Belt, Sleswick, and the North Sea.

Surface.—Except in Bornholm, the surface of Denmark is very similar in every part of the kingdom, and is uniformly low, its highest point (in southeast Jutland) being only five hundred and sixty-four feet above sea-level. The coast is generally flat, skirted by sand-dunes and shallow lagoons, especially along the west side. Both the continental portion and the islands are penetrated deeply by numerous fiords, the largest being Limfiord, which intersects Jutland, and has isolated the northern extremity of the peninsula since 1825, when it broke through the narrow isthmus which had separated it from the North Sea.

Rivers.—Denmark has numerous streams but no large rivers; the principal is the Guden, which flows northeast through Jutland into the Cattegat. It is navigable for part of its course. Less important streams are the Holm, the Lonborg, and the Stor Aa. All the others are insignificant brooks and streamlets.

The lakes are very numerous but not large, none exceeding five and one-half miles in length by about one and one-half miles broad. There are numerous winding inlets of the sea that penetrate far into the land. The largest of these, the Limfiord in Jutland, entering from the Cattegat by a narrow channel, winds its way through to the North Sea, thus making northern Jutland really an island. In this fiord, which widens out greatly in the interior and gives off various minor fiords, there are one large and various small islands.

Climate.—The climate is milder, and the air more humid than in the more southern but continental Germany; it is not unhealthy, except in the low lying islands, such as Laaland, where the short and sudden heat of the summer occasions fevers.

Production and Industry.—The common products are wheat, rye, oats, barley, potatoes, cattle, horses, pigs, sheep, and butter. Its manufactures are, for the most part, for home consumption. Its chief exports are agricultural produce, including wheat and barley, bacon, hams, flour, butter, eggs, hides, skins, corn meal and oil cake, horses and cattle.

People.—The population of Denmark is composed almost exclusively of Danes, with a few thousand Jews and others. The Danes have regular features, fair or brownish hair, and blue eyes. They still maintain their

reputation for seafaring skill and hospitable customs. They belong to the Scandinavian branch of the Teutonic peoples, and speak the Danish form of the old Norse, which was fixed in writing about the time of the Reformation.

Since the Reformation the Danes have been adherents of the Lutheran Church. Education is well advanced, and there are very few people in the country who can neither read nor write.

Government.—The present constitution of Denmark dates from 1866. The executive power is vested in the king and his ministers, the legislative in the *Rigsdag* or Diet, comprising the *Landsthing* or Upper House, and the *Folkething* or House of Commons, partly nominated by the Crown, partly elected, indirectly, by the people.

Cities.—Copenhagen is the capital, population, 560,000; other chief towns are Odense, Aarhuus, Aalborg, Randers and Horsens.

FREDERICK'S CHURCH, COPENHAGEN

Copenhagen (*kō-pen-hāgen;* Dan. *Kjöbenhavn,* "Merchants Haven"), the capital of Denmark, is situated on the low-lying eastern shore of the island of Zealand, in the Sound, which is here about twelve miles broad. The channel forms a fine and capacious harbor, which is bridged over so as to connect the isolated suburb of Christianshavn and the main part of the city at two points. Copenhagen is still defended by the old citadel of Frederikshavn and by forts on the seaward side.

Among its buildings of historical interest or intrinsic beauty, the Cathedral, rebuilt after the bombardment of 1807, possesses statues of Christ and the Apostles, and a baptismal font, designed and in part executed by Thorwaldsen. Frederick's Church, or Trinitatiskirke, is remarkable for its round tower, which is ascended by a spiral incline instead of steps.

The Royal Palace, called Christiansborg, was rebuilt between 1794 and 1828, but suffered greatly from fire in 1884. In the castle of Rosenborg are kept the regalia; the palace of Charlottenborg, is now used as an Academy of Arts. The University, founded by Christian I. in 1479, has a library of three hundred and fifty thousand volumes; the royal library contains six hundred thousand volumes.

Copenhagen is the center, not only of Danish, but of northern literature and art, and is the seat of the unrivaled Museum of Northern Antiquities, and the Thorwaldsen Museum.

The exports include grain, rape-seed, butter, cheese, beef, cattle, wool, etc.; and porcelain, pianos, clocks, watches, mathematical instruments, chemicals, sugar, beer, and tobacco are manufactured.

History.—The early history of Denmark is lost in the twilight of the Vikings and their valiant deeds. The Danes coming from the islands occupied the lands deserted by the Jutes and Angles who had in the fifth century migrated to England. The Danish monarchy was founded in 936 by Gorm the Old, whose son became a Christian. Waldemar I. (1157-1182) ruled Norway also, and conquered Mecklenburg and Pomerania; under his son Waldemar II. further conquests were made in German and Wendish lands, so that the Baltic became a Danish sea.

By the treaty of Calmar in 1397, Norway, Sweden and Denmark, already under one monarch, Margaret, were formally united into one state. In 1448 the Danes elected as king Christian of Oldenburg, a descendant of their royal family, who was also Duke of Sleswick and Holstein; and his line continued on the throne till 1863.

Sweden became independent in 1523. Lutheranism was introduced into Denmark in 1527. In 1815 Denmark had to cede Norway to Sweden; and in 1848 the Germanic peoples of the duchies Sleswick and Holstein rebelled against Denmark. For the time the Danes succeeded in retaining the duchies, but the controversy, renewed in 1863, led to the defeat of the Danes by Austria and Prussia (1864), followed by the incorporation of the duchies in the Germanic Confederation, and, after the Austro-Prussian war of 1866, in Prussia.

Denmark although reduced to the narrow limits of the islands and Jutland, has greatly prospered, in spite of the spread of socialistic opinions, and political dissensions. Christian IX. died January 29, 1906, and was succeeded by his son, Frederick VIII.

GREECE is a maritime kingdom in the southeast of Europe. The country is composed of a continental portion, almost separated into two parts by the gulfs of Patras and Lepanto on the west, and the gulf of Ægina on the east, the archipelago of the Ægean Sea and the Ionian Islands, and is divided into twenty-six provinces, called nomarchies.

Surface.—The mountain range which cuts off the peninsula from the continent of Europe is an extension of the Balkans. From it run chains from north-northwest to south-southeast, which form the skeleton of Greece. The western boundary of Thessaly is formed by Pindus, the main offshoot of the Balkans. The eastern boundary is also marked not only by the sea but by important mountains derived from the Balkan system. These are Olympus, Ossa, Mavrovuni, and Pelion. Othrys, a branch of Pindus, forms the south boundary of Thessaly. This branch is continued in the celebrated mountains Parnassus and Helicon, forms the land of Attica, and reappears as the islands of Ceos, Cythnos, Seriphos, and Siphnos. The Peloponnese, "the island of Pelops," or by its modern name the Morea, is connected with northern Greece merely by the narrow isthmus of Corinth, now pierced by a canal; its highest point is Taygetus.

Rivers.—The rivers of Greece are unimportant. The chief in the Peloponnesus are the Eurotas (Basilipotamo), the Alpheus (Ruphia), draining Arcadia and Elis; and the Peneus draining Elis.

Climate.—The climate is generally mild, in the parts exposed to the sea equable and genial, but in the mountainous regions of the interior sometimes very cold. None of the mountains attain the limit of perpetual snow; but several retain it far into the summer. During summer rain scarcely ever falls, and the channels of the minor streams become dry. Toward the end of harvest rain becomes frequent and copious, and fevers become common.

Production and Industry.—The most important of the fruit trees are the olive, the vine, orange, lemon, fig, almond, citron, pomegranate, and currant grape. Its exports consist of currants, figs, olive oil, wine, cognac, tobacco, hides, lead, iron ore, magnesium, emery, marble, and sponges.

People.—The Greeks called themselves *Hellenes*, and the inhabitants of Italy called them *Graeci*. The modern Greeks are by no means pure-bred descendants of the ancient Greeks. Indeed, it has been maintained that from the seventh century A. D. there have been no pure Greeks in the country, but only Slavs. It is, however, pretty certain that the two and one-quarter million of modern inhabitants are descendants of the three races that occupied the soil at the time of the Roman conquest. They speak the modern Greek tongue, which is a greatly modified form of the old.

Education is free and compulsory, maintained by local taxation supplemented by State grants. Secondary education is somewhat backward, particularly in the country districts. There is a university of some repute at Athens, which is largely attended by Turks.

Government.—According to the constitution, which was framed by an assembly in 1864, the executive power is vested in the king and his responsible ministry; the legislature is a single chamber of deputies called the *Boulé*, elected by the people, and meets at Athens.

Cities.—Athens is the capital, population 167,500; the towns next in size are Patras, Piræus, and Trikhala, all above 20,000; and there are eight others between 20,000 and 10,000.

Athens, in the southeast of Attica, occupies an extensive area round the site and remains of the classical city, four and one-half miles from its harbor of Piræus, on the Gulf of Ægina. The city, which takes its name from Athena, "goddess of science, arts, and arms," and its own patron divinity, was originally built on the Acropolis, a conspicuous limestone rock rising three hundred and twenty feet above the Attic plain, and afterwards spread out on the plain below. The Acropolis became the citadel and subsequently the site of a group of beautiful temples of the time of Pericles (fifth century, B. C.).

The ruins of the Parthenon, the Erechthéum, the temple of Nike Apteros ("Wingless Victory"), and the Propylæa, still remain to testify to the former glory of the Acropolis. Of the other ancient buildings the most notable are the Theseum (also of the Periclean period, and still almost perfect), and the fragments of the vast temple of Zeus (begun in 530 B. C. and finished by the Roman Emperor Hadrian), with the theater of Dionysus and other structures.

Not far from the Acropolis rose the hill Lycabettus (nine hundred and eleven feet), and the hillocks or ridges of the Pnyx and the Areopagus or Mars Hill. At a greater distance the plain is bounded by Hymettus (three thousand three hundred and sixty-eight feet), Pentelicus (three thousand six hundred and forty-one feet), and other ranges.

Athens was fabled to have been founded by the hero Cecrops. The most brilliant period of its history was when, after the Persian wars (fifth century, B. C.), Athens took the lead among the Greek states, became powerful by land and sea, was adorned by Pericles with most glorious buildings, and brought Greek literature and Greek philosophy to their highest development. Its decline dates from the disastrous conclusion of the Peloponnesian war (403 B. C.). It was plundered and ruined by Sulla in 87 B. C.; and neither under Byzantine nor Turkish rule ever attained any prosperity. In the days of its glory Athens had some one hundred thousand free inhabitants and twice as many slaves; when after the liberation of Greece Athens was made the capital of the new kindgom (1834), it was a wretched village of a few hundred houses. Since then it has had a prosperous growth, looks like a well built German town, with a fine royal palace, a marble stadium (restored), a university with over one hundred and fifty professors and lecturers and two thousand five hundred students, and a good deal of miscellaneous trade by the way of the Piræus. It is connected by rail also with Corinth, and the Athens-Larissa line brings Greece into railway communication with the rest of Europe. (See also under ancient Greece.)

History.—Modern Greece threw off the Turkish yoke in 1830 and was declared an independent kingdom and the boundaries were defined. The liberated state was at first governed by a national assembly, but the president, Count Capo D'Istrias, assumed autocratic powers, and sedition culminated in his assassination. Subsequently the Powers offered the throne to Prince Leopold (afterwards

king of Belgium), but the offer was refused. The crown was then given to Otho, son of Louis I. of Bavaria. Throughout his reign discontent was rife, and an insurrection in 1862 resulted in the deposal of the king. George, second son of the king of Denmark, was then chosen king, and the Ionian Islands, at that time under British protection, were ceded unconditionally to the kingdom.

By the Berlin Congress of 1878, Greece was promised a modification of her frontier, and in 1881 a readjustment was accepted. The adjustment proved distasteful to the Hellenes, who demanded Crete, and hostilities commenced with Turkey in 1897. The war was short-lived, and was disastrous to the Greeks, and on the intervention of the Powers an armistice was concluded. By the Treaty of Constantinople Greece was compelled to pay an indemnity to submit to the readjustment of her frontier, and to accept the control of the Powers in financial affairs.

In October, 1912, war broke out in the Balkan states, known as the Balkan war. The permanent effects on the Greek frontier, owing to the Hellenic participation in the victory over the Turks, are not yet determinable, but all deeply affect Greek interests, and depend on the decision of the Great Powers. George, King of the Hellenes, was assassinated in Salonica by a maniac named Schinas in March, 1913. The perpetrator of the crime subsequently committed suicide. The present ruler is the late king's eldest son, who was proclaimed King Constantine XII.

HOLLAND, the popular name of a country officially described as "Netherland," or "The Netherlands," is bounded by the North Sea, Prussia, and Belgium. Its greatest length, north to south, is one hundred and ninety-five miles, and its greatest breadth one hundred and ten miles. Luxemburg was, till 1890, connected with Holland.

Surface.—Almost the whole country is flat and low; the parts of it nearest the coasts are even below the sea level, the waters being kept out by dykes, which are maintained at a great annual cost. One stretch of fifty miles of the coast is guarded by a triple wall of piles driven into the soil, filled up between, and buttressed by huge granite blocks brought from Norway. If it were not for these dykes controlling the rivers and keeping out the sea, nearly half the country would be under water.

All the southern part of Holland belongs to the alluvial delta lands formed at the mouths of the Rhine (the chief branch of which is named the Waal), the Meuse or Maas and Scheldt. Opening out into broad, shallow estuaries these river mouths form a number of islands, of which Walcheren and Beveland, Schouwen and Tholen, Over Flakkee, Voorne and Beyerland, are the largest.

Toward the north appears the great shallow gulf called the Zuider Zee (or South Sea, in distinction from the North Sea outside), which was formed in the thirteenth century by the bursting of the sea into a former inland lake called "Flevo" by the Roman geographers. Outside of it a chain of islands marks the line of the former coast of the mainland.

Rivers and Canals.—Besides the natural channels formed by the estuaries of the Scheldt, the Maas, and the delta branches of the Rhine (the Waal, Lek, Old Rhine, Vecht, Amstel, and Yssel) the country is intersected in all directions by *Grachts* or larger canals, lined with rows of trees, joining river to river. No country in the world has such a network of waterways; ships' masts, and windmills with large sails, pumping the water from the smaller drainage canals, are seen everywhere.

Climate.—The general climate of Holland resembles that of England, opposite to it, in its rapid variations; but it is more humid. Dense sea fogs from the North Sea drive over it. In most winters the rivers and canals are frozen over for two or three months, when even women skate to market; in summer the thermometer rises to eighty or ninety degrees in the shade.

Production and Industry.—Cattle rearing, butter and cheese making, are the most general industries of the country, for the grazing meadows are far more extensive than the corn lands. In the latter, rye, barley, wheat, and potatoes are the chief crops. Flax, and beet-root for sugar, chicory, and tobacco, are grown also to a considerable extent.

The principal manufactures are shipping, bricks, margarine, cocoa, chocolate, linen, rich damasks, cottons, woolens, cigars and other manufactured tobacco, candles, confectionery, earthenware and pottery, glass bottles and ware, chemical and pharmaceutical products, matches, perfumery, sugar, bicycles and automobiles, boots and shoes, starch, potato flour, engines, metal substances, works of art in gold and silver, incandescent lamps, machinery, motors, paper, printing, oils, beer, "geneva" and other liqueurs. Diamond cutting employs numerous hands in Amsterdam.

People.—Of the population, the greater part (seventy per cent) is formed by the Dutch or Batavians, the descendants of the Germanic tribe of the Batavi who occupied the delta of the Rhine in the time of the Roman conquest of the land. Frieslanders (fourteen per cent), descendants of the ancient Frisii, occupy the northern borders of the country, where the peasantry still speak a language closely allied to Anglo-Saxon; the Flemings (thirteen per cent) occupy the southeastern borders of the country. Their language differs little from the Dutch; but the dialects throughout the country are very numerous.

The majority, about three-fifths, belong to the several Reformed Churches; and the remainder are Roman Catholics, with about one hundred and seven thousand Jews.

Private state-aided primary instruction is encouraged rather than public, though the latter is provided, if required, by local taxation. Secondary schools for working classes are numerous, well equipped and attended. The principal universities are at Amsterdam, Groningen, Leiden, Utrecht.

Government.—The government of Holland is a limited constitutional monarchy. The crown is the executive power; legislation is vested in the States-general of two chambers, called the

First Chamber and the Second Camber. A State Council of fourteen members appointed by the Sovereign is consulted on all legislative and on most executive matters.

There is no state religion, but the state gives financial support to the different churches.

Cities.—The capital is The Hague with a population of 300,000; other cities exceeding 50,000 in 1913 were as follows: Amsterdam, 591,053; Rotterdam, 454,135; Utrecht, 123,457; Groningen, 78,670; Haarlem, 70,907; Arnhem, 64,760; Leiden, 59,297; Nymegen, 58,679; Tilburg, 54,216.

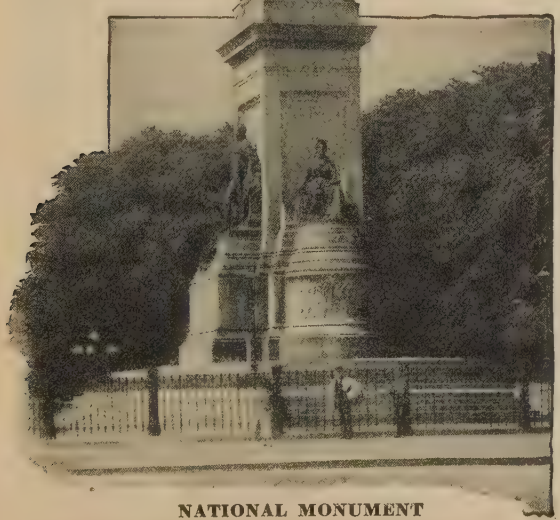
PALACE IN THE WOOD,

or Dutch "White House," is situated in a fine old plantation of beeches and oaks, round ornamental lakes and islands, is a plain building with a grand interior; and has Jordaen's masterpiece, the Apotheosis of Prince Fred. Henry.

The Hague (Dutch *Gravenhagen*, "the count's hedge"), the capital of the Netherlands is two miles from the North Sea and fifteen miles northwest of Rotterdam. It is intersected by canals and shady avenues of lime-trees, and has many fine public buildings and private houses.

In the center of it is the Vijver, or Fish-pond, to the south of which stands the old castle of the Counts of Holland, where the Dutch parliament sits. In its gatetower the brothers De Witt were confined till dragged thence and torn to pieces by the populace (1672). The picture-gallery has a splendid collection of works by native painters (Paul Potter's "Bull" and Rembrandt's "Lesson in Anatomy"); and there are the royal library with five hundred thousand volumes; the municipal and other museums; the Town-House, and the royal palaces.

Among the numerous statues are those of William I. (two in number), William II., Spinoza, Bernhard of Saxe-Weimar, and the monument which commemorates the deliverance from the French. Close to the town is the beautiful pleasure-park called "The Wood" (*Bosch*), in which stands a royal residence with the magnificent so-called "Orange Hall."



NATIONAL MONUMENT IN THE WILLEMS-PARK, THE HAGUE

The great Peace Conference was held here in 1899; The Hague is the seat of the resulting arbitration courts, for which Mr. Carnegie provided permanent buildings of great architectural beauty. Industries are iron-founding, copper and lead smelting, cannon-founding, printing, furniture and carriage making, and the manufacture of gold and silver lace.

History.—The ancient inhabitants of the country, the Batavians and the Frisians, became subjects or allies of the Romans in the first century A. D., and so remained till in the fourth century their territories were overrun by the Saxons and Salian Franks.

At the end of the eighth century the Low Countries submitted to Charlemagne, and various feudal dukedoms, counties, and lordships were gradually established (the countship of Holland in the eleventh century). In 1384 the earldom of Flanders passed to the Dukes of Burgundy, and Philip the Good (*c.*1450) made the Low Countries as prosperous as any part of his Burgundian state.

The Emperor Charles V. inherited the Burgundian dominions; and under his son, Philip II. of Spain, broke out the bitter quarrel between Holland and Spain, between Dutch Protestantism and persistence and Spanish tyranny and persecution, which ended in 1581 in the establishment of the Dutch Republic as an independent state under William the Silent (of Orange), though the war continued with intervals till 1648, and the Belgian provinces abode by their allegiance to the kings of Spain.

In the seventeenth century Dutch commerce, especially at sea, Dutch science, Dutch classical scholarship, Dutch literature and Dutch art attained an eminence hardly afterwards equalled. The rivalry of Holland and England at sea led to the

unfortunate wars of 1652-1654 and 1664-1667. The accession of William III. of Orange to the Stadtholdership of the United Provinces (1672) proved the salvation of the republic from France; in 1678 Louis XIV. signed the peace of Nymegen.

Ten years later William was hailed as the savior of English liberties, and became king of Great Britain and Ireland. On William's death, the United Provinces became a pure republic once more, the stadtholdership was re-established in 1747 but it made no difference in the downward course.

The National Convention of France having declared war against Great Britain and the stadtholder of Holland in 1793, French armies overran Belgium (1794); they were welcomed by the so-called patriots of the United Provinces and William V. and his family (January 1795) were obliged to escape from Scheveningen to England in a fishing-smack and the French rule began. After several changes Louis Bonaparte, June 5, 1806, was appointed king of Holland, but, four years later, was obliged to resign because he refused to be a mere tool in the hands of the French emperor. Holland was then added to the empire.

The fall of Napoleon I. and the dismemberment of the French empire led to the recall of the Orange family and the formation of the southern and northern provinces into the ill-managed kingdom of the Netherlands, which in 1830 was broken up by the secession of Belgium. In 1839 peace was finally concluded with Belgium; but almost immediately after national discontent with the government showed itself, and William I. in 1840 abdicated in favor of his son.

Holland, being moved by the revolutionary fever of 1848, King William II. granted a new constitution, according to which new chambers were chosen, but they had scarcely met when he died, March. 1849, and William III. (born 1817) ascended the throne.

William III. having no living male issue, the succession to the crown was vested in the princess of Orange, Wilhelmina, the only child of the king's second marriage, born in 1880. For many years the great question of internal politics was the new constitution, which, promulgated November 30, 1887, increased the electorate of Holland by no less than two hundred thousand voters. On the death of the king (November 23, 1890), when Luxemburg ceased to be connected with the crown of Holland, the Princess Wilhelmina became queen.

Queen Wilhelmina married Prince Henry of Mecklenburg-Schwerin, in 1901, and in 1909 a daughter (the Princess Juliana) was born to them.

NORWAY (Norweg. *Norge*), the western division of the Scandinavian peninsula, is one thousand one hundred and sixty miles in length (coast-line three thousand miles) and varies in width from twenty to one hundred miles north of 63° N. lat.; below that line it swells out to two hundred and sixty miles. The coast-line is extensive, deeply indented with numerous fiords, and fringed with an immense number of rocky islands. The surface is mountainous, consisting of elevated and barren tablelands, separated by deep and narrow valleys. The finest of the valleys stretching inland from the fiords is Romsdal, where the rounded pure gneiss mountains tower up to six thousand feet with almost perpendicular walls. The cultivated area is about one-thirtieth part of the country; forests cover nearly one-fourth; the rest consists of highland pastures or mountains.

Norway is separated from Sweden by the Kjolen Mountains (three thousand to six thousand feet), the backbone of the peninsula, which divide south of 63°; the western branch widens out into a broad plateau, undulating between two thousand and four thousand feet and embossed with mountain-knots—Dovre, Jotun, Lang, Fille, Hardanger Fjelde (*fells*)—the separate peaks of which shoot up to six thousand feet and higher.

Rivers.—The few important rivers that Norway can claim as exclusively her own have a southerly direction, and discharge themselves into the Skager-Rack; of these the chief are the Glommen (four hundred miles), and its affluent, the Lougen. The most important river in the north is the Tana, which forms part of the boundary between Russia and Norway, and falls into the Arctic Ocean. Lofty waterfalls are numerous. Lakes are extremely numerous but generally small. The principal is the Miösen Vand. The streams are turned to account in floating down the valuable timber of the forests, and their rapids give abundant mill power.

Production and Industry.—Agriculture, though pursued with some vigor of late, is unable to furnish sufficient products for home consumption; hence it has been necessary to import considerable quantities of corn, meat, and pork. The fisheries give employment to a large part of the population throughout the year. The most important are cod and herring. The mineral products are of late increasing.

The purely industrial establishments are grouped mainly around Christiania, and include textile factories, machine shops, chemical works, flour mills, breweries, etc. The use of water power for electrical enterprises is growing. The Norwegians rank among the busiest sea carriers of the world, the Norwegian mercantile marine ranking third among maritime nations, or first in proportion to population.

The chief exports consist of timber, matches, fish, oil, and other products of the fisheries, pulp, paper, skins and furs, nails, minerals, stone, ice, calcium carbide, condensed milk, butter, margarine, tinned goods, etc.

People.—The people of the peninsula are of Germanic race, with the exception of the small number of Finns and the Lapps in the north. The Norsemen of Norway, of middle stature, strong, generally blonde haired and blue eyed, seamen by choice, have adopted the Danish as the language of the towns and of literature, the modernized Old Norse being banished to the outlying country districts and unfrequented fiords.

Education is compulsory and free between the ages of seven and fourteen, schools being maintained by local taxation with state grants

in aid. The attendance is high. Secondary schools are provided by the state, by local authorities, and privately. There are a number of special schools and industrial and technical institutes. The University of Christiania is an important institution for higher education.

Except 52,700 persons (including Methodists, Baptists, Roman Catholics, Jews, Mormons), the entire population belong to the Lutheran Church.

Government.—After the crisis of European affairs brought about by Napoleon's wars, Denmark lost her hold over Norway, which had been united to it for more than four centuries, and that country was united to Sweden in exchange for Finland, which then passed under Russian sway. Norway, however, was again separated from Sweden as an independent kingdom under King Haakon VII. in 1905.

The *Storthing* or Parliament consists of one hundred and twenty-three members, women being eligible and electors (since 1907); and divides for legislative purposes into two chambers called "*Odelsting*" and "*Lagting*."

The Norwegians share with the Swiss the distinction of being the most democratic people in Europe; all titles of nobility were abolished in 1821. In 1912 practically all offices except in the cabinet, diplomatic service, army, navy, and church, were thrown open to women.

Cities.—The chief cities are the capital, Christiania, and Bergen. Other important towns are Trondhjem, Stavanger, and Drammen.

Christiania, the modern capital and chief commercial town of Norway (the ancient capital is Trondhjem, "home of the throne," where the kings are still crowned), is built on the northern end of the Christiania Fiord. Population, in 1910, 241,834. It is named after Christian IV., who commenced building it in 1624 after the destruction of the ancient city of Oslo by fire. It is the seat of Parliament, of the High Court of Judicature, and of the National University. Connected with this are the students' garden, a library of four hundred and fifty thousand volumes, a botanical garden, zoological and other museums, laboratories, and observatory. The Meteorological Institute was established in 1866. There are two national and historical palaces here, one in the city quite near the university, and one, Oscarshall, beautifully situated two miles from the city on an eminence overlooking the fiord. There is a national picture-gallery, and a very interesting museum of northern antiquities. The *Dom* or Cathedral and Trinity Church are the principal ecclesiastical buildings. The old fortress *Akershus Faestning* still remains, but has little military value.

The staple industry of Christiania is its shipping trade; its chief export is timber. A considerable industry is the brewing of *Christiania öl*, a sort of lager beer, with resinous flavor, largely consumed throughout Norway, and exported. The minor manufactures are cotton, canvas, engine-works, nailworks, paper-mills, and cariole-making. The harbor is closed by ice for three or four months most winters.

History.—It is not until the ninth century that the story of Norway begins to emerge from the obscurities of myth and legend. At first it was occupied by Lapps and by several Gothic tribes, then became an independent kingdom, founded in 872, and was united to Denmark in 1380.

The Napoleonic crisis in Europe may be said to have severed the union, which had existed for more than four hundred years between Norway and Denmark. The latter country after having given unequivocal proofs of adhesion to the cause of Bonaparte, was compelled, after the war of 1813, to sign the treaty of Kiel in 1814, in which it was stipulated by the allied powers that she should resign Norway to Sweden. Charles XIII. was declared joint king of Sweden and Norway in 1818. From that time down to 1905 Norway remained in union with Sweden. In June of that year Norway declared the union dissolved, and the repeal of the union was signed in October of the same year. The throne was offered to and declined by a prince of the reigning house of Sweden, but was afterwards accepted by Prince Carl of Sweden, who was thereupon elected as King Haakon VII. In 1908 a treaty was signed by Great Britain, Germany, France, Russia, and Norway guaranteeing the integrity of the Norwegian kingdom.

Poland (called by the natives *Polska*, a word of the same root as *Pole*, "a plain"), a kingdom of Europe, proclaimed, in 1916, by the governments of Austria-Hungary and the German Empire as the result of conquests by the Central Powers, comprises substantially what is geographically known as Russian Poland (the kingdom of Poland formed in 1815) and Austrian Poland (or the Austrian province of Galicia). The former has an area of about 49,000 square miles, with a population of more than 12,000,000; the latter, an area of 30,300 square miles, and a population of 8,000,000.

Surface.—This extensive tract forms part of the great European central plain, and is crossed by only one range of hills, which run northeast from the Carpathians, forming the watershed between the Baltic and Black Seas.

Its principal streams are the Vistula, the Niemen, and the Dwina, all belonging to the basin of the Baltic; and the Dniester, South Bug, and Dnieper, with its tributary, Pripet, belonging to the basin of the Black Sea.

The physical configuration of the country makes it admirably adapted for agriculture. Next to grain and cattle its most important product is timber.

The soil is mostly a light fertile loam, though there are large barren tracts of sand, heath, and swamp, especially in the east. Much of the fertile soil is rich pasture land, and much is occupied with forests of pine, birch, oak, etc. Rye, wheat, barley, and other cereals, hemp, timber, honey, and wax, cattle, sheep, and horses, vast mines of salt and coal, some silver, iron, copper, and lead constitute the natural riches of the country.

People.—The present population of the provinces, included in the Poland of former days, consists chiefly of Poles, Lithuanians, Germans, Jews, Malo-Russians, Roumanians and Gypsies. The Poles, who number 10,000,000, form the bulk of the population; the Lithuanians, 2,100,000 in number, inhabit the northeast of the country; the Germans, of whom there are 2,000,000, live mostly in the towns; the Jews are very numerous, being estimated at 2,200,000.

Roman Catholics preponderate; then come in order the Greek Church, Protestants, Jews, and Armenians.

Cities.—The following are the populations of the chief cities: Capital, Warsaw, 800,000; Lodz, 400,000; Lemberg, 225,000; Cracow, 160,000; Przemysl, 60,000.

Warsaw (Polish *Warszawa*), the capital of Poland, stands on the Vistula's left bank, three hundred and thirty miles east of Berlin by rail and seven hundred miles southwest of Petrograd. Two iron bridges lead to the suburb of Prague, on the opposite bank. Standing on a navigable river, with great railway lines to Moscow, Petrograd, Vienna, Danzig, and Berlin, Warsaw is one of the most important cities of eastern Europe, being smaller only than Petrograd and Moscow. Corn and flax are largely exported, and coal and manufactured goods imported. Warsaw itself manufactures electroplate, machinery, boots, woolens, pianos, carriages, tobacco, sugar, chemicals, beer, and spirits.

Of over one hundred Catholic churches the cathedral of St. John is the most notable; there are also several Greek churches, two Lutheran ones, and many synagogues. The castle is an imposing building, and there are many fine private palaces. The university, suppressed at various times, was reopened in 1915, and has seventy-five professors who now teach in Polish.

History.—The early history of Poland is legendary and obscure. The Poles, like the Russians, are a Slavonic race, and are first spoken of as the Polani, a tribe or people between the Vistula and Oder. The country was divided into small communities until the reign of Mieczyslaw I. (962-992) of the Piast dynasty, who renounced paganism in favor of Christianity, and was a vassal of the German emperor.

He was succeeded by Boleslaw the Great (992-1025), who raised Poland into an independent kingdom and increased its territories. In succeeding reigns the country was involved in war with Germany, the Prussians, the Teutonic knights, and with Russia. The last of the Piast dynasty was Casimir the Great (1364-1370), during whose reign the material prosperity of Poland greatly increased. He was succeeded by his nephew, Louis of Anjou, king of Hungary, whose daughter, Hedwig, was recognized as "king" in 1384, and having married Jagello, prince of Lithuania, thus established the dynasty of the Jagellons, which lasted from 1386 to 1572.

During this period Poland attained its most powerful and flourishing condition. In 1572 the Jagellon dynasty became extinct in the male line, and the monarchy, hitherto elective in theory, now became so in fact. The more important of the elective kings were Sigismund III. (1587-1637), Wladislaw or Ladislaus IV. (1632-1648), John Casimir, (1648-1669), and the Polish general Sobieski, who became king under the title of John III. (1674-1696). He was succeeded by Augustus II., Elector of Saxony, who got entangled in the war of Russia with Charles XII., and had as a rival in the kingdom Stanislaus Lesczynski. Augustus III. (1733-1763) followed, and by the end of his reign internal dissensions and other causes had brought the country into a state of helplessness.

In 1772 under the last feeble king Stanislaus Augustus (1764-1795), the first actual partition of Poland took place, when about a third of her territories were seized by Prussia, Austria, and Russia, the respective shares of the spoil being Prussia 13,415 square miles, Austria 27,000 square miles, Russia 42,000 square miles.

A second division between Russia and Prussia took place in 1793. Prussia received nearly all the present province of Posen, and the western part of what is now Russian Poland; Russia received all the territory east of about long. 44°. A third division between Russia, Prussia, and Austria occurred in 1795. Prussia took a large part of the present Russian Poland, including Warsaw; Austria received part of the present Russian Poland between the Bug, Vistula, and Pilica; and Russia received all the remainder, situated east of the Niemen and Bug.

An insurrection under Koszciusko had taken place in 1794, but he was defeated at the battle of Maciejowice and taken prisoner. Suvorov (Suwarrow), the Russian general, took Warsaw, and the Polish monarchy was at an end. King Stanislaus resigned his crown, and died at Petrograd in 1798.

Part of Poland was formed by Napoleon into the duchy of Warsaw. The Congress of Vienna in 1815 made a resettlement of the territory, creating a kingdom of Poland, under Russian rule, with a constitution. An insurrection which began in November, 1830, was suppressed in September, 1831; the constitution was abolished in 1832. From this time the independence of Poland was suppressed, and in 1832 it was declared an integral part of the Russian empire, with a separate administration, headed by a viceroy chosen by the Czar. On November 6, 1848, the republic of Cracow became Austrian; and the subsequent rebellion against Russian rule in 1863 only brought further humiliation on Polish hopes and aspirations.

During the European war Poland, in 1914, first suffered invasion and devastation by the Russian armies, and during the two following years was completely overrun by the Austro-German armies, and placed under the military rule of the latter. The proclamation of Poland as a new independent kingdom took effect in 1916.

PORTUGAL (named from Portus Cale, the Roman name of Oporto), a republic of Europe, lying between Spain and the Atlantic, on the west side of the Iberian Peninsula, is three hundred and fifty miles in length and varies in width from seventy to one hundred and forty miles. The area is 36,038 square miles—a little larger than Ireland.

Surface and Climate.—The coast is mostly low and flat, except immediately north and south of the mouth of the Tagus, and at Cape St. Vincent. The north of Portugal is diversified by spurs (five thousand feet) of the mountains of Spanish Galicia. The Sierra da Estrella (six thousand five hundred and forty feet) is a westward continuation of the Spanish Sierra Guadarrama system. The Sierra Morena is continued westwards in southern Portugal.

The principal rivers of the country—the Guadiana in the south, the Tagus in the center, and the Douro and Minho in the north

—are simply the lower courses of Spanish rivers; but the Mondego has its sources in the country.

The vicinity to the ocean tempers the climate and exempts it from the dry heat of Spain. The inequalities of the surface produce, however, diversities of climate; for, while snow falls abundantly on the mountains in the northern provinces, it is never seen in the southern lowlands. Rain falls abundantly throughout the year.

Production and Industry.—The chief products are wheat, barley, oats, maize, flax, hemp, and the vine in elevated tracts; in the lowlands, rice, olives, oranges, lemons, citrons, figs, and almonds. There are extensive forests of oak, chestnut, sea pine, and cork, the cultivation of the vine and the olive being among the chief branches of industry; the rich red wine known to us as "port" is shipped from Oporto. Its mineral products are important—copper, lead, tin, antimony, coal, manganese, iron, slate, and bay salt, which last, from its hardness and purity, is in demand. Its manufactures consist of gloves, silk, woolens, linen, and cotton fabrics, metal and earthenware goods, tobacco, cigars, etc. The exports consist to the extent of fifty per cent of wine, which is the chief industrial product of the country; others are cork, cattle, copper ore, fruits, oil, sardines, and salt.

People.—The Portuguese are a mixed race—original Iberian or Basque, with later Celtic admixture. Galician blood (derived from the ancient Gallaici, presumably Gallic invaders) predominates in the north; Jewish and Arabic blood are strongly present in the center, and African in the south.

The Portuguese differ widely from their Spanish brethren, whom they regard with inveterate hatred and jealousy, mainly on account of their attempts to subvert the independence of Portugal.

Education is free and nominally compulsory between the ages of seven and fifteen, but is not strictly enforced, and over seventy-five per cent of the population above seven years old are illiterate. Secondary education is conducted in state lyceums. There are also military, naval and other special schools. The University of Coimbra is the chief higher institution.

Government.—Portugal was a constitutional monarchy till 1910, when a republic was established. The constitution of 1911 provides a Senate, elected by municipal councils, and a National Council, by direct suffrage. The two chambers united constitute the Congress of the republic. The president of the republic is elected by both chambers for a period of four years. He cannot be re-elected.

Cities.—Capital, Lisbon, on the Tagus, population, 435,359. Oporto had a population (1911) of 194,664. There are no other large towns, but Braga, Loulé, Setubal, and Funchal (Madeira) had populations exceeding 20,000 in 1911.

Lisbon (Port. *Lisboa*), capital of Portugal, stands on the northern shore of a bottle-shaped expansion of the Tagus, nine miles from its mouth; it is four hundred and twelve miles by rail west by southwest of Madrid. The city extends for four or five miles along the shore, and climbs up the slopes of a low range of hills, occupying a site of imposing beauty.

The oldest part of Lisbon is that which escaped the earthquake of 1755; it lies on the east, round the citadel, and consists of narrow, intricate streets, not over clean. It is still known by its Moorish name of Alfama. The western portions were built after the earthquake, with wide and regular streets, fine squares, and good houses. The summits are mostly crowned with what were formerly large monasteries.

The gloomy cathedral of the "patriarch," built in 1147, restored after 1755, has a Gothic facade and choir. The large church of St. Vincent contains the tombs of the former royal (Braganza) family. The church of Estrella is a reduced copy of St. Peter's at Rome. In San Roque is a chapel thickly encrusted with mosaics and costly marbles. But the finest structure in the city is the Gothic monastery and church of Belem, a monument to the great seamen of Portugal; it was begun in 1500 on the spot from which Vasco da Gama embarked (1497) on his momentous voyage. Inside the church are tombs to Camoens and Vasco da Gama, and the grave of Catharine, wife of Charles II. of England.

A fine square facing the bay is surrounded with government offices, the handsome custom-house, and the marine arsenal. There are an academy of sciences, with a library of one hundred and twenty thousand volumes, a polytechnic school, a medical school, a conservatory of music, a public library of four hundred thousand volumes and two observatories.

A magnificent aqueduct brings water to the city from springs nine miles to the northwest.

A series of forts protect the seaward approaches. The harbor is one of the finest in the world, well sheltered, deep close to the quays, and capacious enough to hold all the navies of Europe at once.

History.—Like the rest of Iberia, Portugal (the southern part of which was known to the Romans as Lusitania, often taken as a poetical name for the whole country) was thoroughly Romanized after the conquest of the Carthaginians by the Romans in 138 B. C. Then the peninsula was overrun by the Visigoths, and next by the Saracens. Northern Portugal fell under the influence of Castile; but under Alfonso I. (1143) Portugal became an independent kingdom, though the Saracens were not conquered in the south till 1250. Wars with Castile were frequent.

Under John (1385-1433) began a close alliance between Portugal and England, and the Portuguese king John married John of Gaunt's daughter. With their son, Prince Henry the Navigator, began the most brilliant era of discovery and conquest, including the acquisition of Madeira, the Azores, and the doubling of the Cape of Good Hope (1486), the reaching of India by sea and settlements there (1497), and the discovery and occupation of Brazil (1500).

In the sixteenth century Portugal was one of the most powerful monarchies of Europe, and most prosperous of commercial peoples; but its decline was swift, and Philip II. annexed Portugal to Spain for sixty years. English assistance secured the independence of the kingdom in 1640; but the glory had departed. Portugal shared in the troubles of the French occupation and the Peninsular war; after Napoleon's defeat, the old family, which had taken refuge in Brazil, was restored, but the country was rent by intrigue, dissension, and civil war.

The rush of the European powers to occupy central and southern Africa stirred Portugal to cling tenaciously to her once great colonial empire in Africa; but the march of events has given to Britain, Germany, France, and Belgium much that Portugal once claimed as hers.

Popular discontent culminated in the assassination of King Carlos and his eldest son in the streets of Lisbon in February, 1908. His second son, Manoel, succeeded. In 1910 the murder of Dr. Bombarda, a republican, hastened on a revolution already arranged for. The army and navy assisted in deposing Manoel and setting up a provisional government, with Theophile Braga as provisional president. He retired in 1911, and in August of that year Dr. Manoel Arriaga was elected as the first president of the republic.

The republic was formally recognized by the United States upon the meeting of the Portuguese chambers in June, 1911, and by the other powers on the formation of the cabinet in September, 1911. In 1915 Portugal joined the Entente Allies in the European war.

ROUMANIA, a kingdom in southeast Europe, lies mainly between the Carpathians, the Purth, and the Danube (the Dobruja being south of the Danube). It includes the strip added from Bulgaria as "compensation" for changes consequent on the Balkan war of 1912-1913, from a point on the Danube above Silistria to Cape Sabla on the Black Sea. Bordering on Hungary, Russia, Bulgaria, and Servia, its area is 52,000 square miles, and population 7,500,000.

Surface.—Roumania consists for the most part of a great treeless steppe-like plain, occupying nearly the whole of the northern watershed of the Lower Danube; behind this plain rise the wooded Transylvania Alps. Between the northern bend of the river to its marshy delta and the Black Sea there rises the bare plateau called the Dobruja, partly grass-covered, partly swampy, without tree or bush. This famous old battle-ground is crossed by Trajan's double wall or rampart, built to keep the northern barbarians out of the Roman provinces.

Rivers.—All the rivers are tributaries of the Danube, and flow from the Carpathians and the Transylvanian Alps across the level steppe to join its left bank. The chief are the Pruth, which now forms the boundary towards Russia, the Sereth, and the Oltu (Aluta).

People.—Most of the Roumanians are supposed to be descendants of the race formed by the alliance of the Roman colonists with the original inhabitants of Dacia. The Roumanian language is derived mainly from Latin, with Slavonic, Hungarian, and other elements.

They are strong, well-knit men, with black hair, lively, but not very active. The mass of the people live in great poverty; a few thousand Boyars, nobles or landed proprietors, really form the nation. Large numbers of Jews and Gypsies live among the Roumanians. Almost the entire population belongs to the Greek Church, but religious equality prevails.

Government.—The constitution, voted by a popular assembly in 1866, vests the executive authority in the reigning king and his council of ministers; the legislative body consists of a Senate and a Chamber of Deputies.

Production and Industry.—The agricultural products consist of wheat, maize, millet, barley, rye, beans, and peas. Vines and fruits are abundant. The forests are of great extent and importance, but the riches of the country consist mainly in its cattle and sheep. Minerals and precious metals are said to be abundance, but only salt and petroleum are obtained.

Education is free and nominally compulsory, but owing to inadequate provision over sixty per cent of those above seven years of age are illiterate. Secondary education is relatively better, and the schools are well attended. There are also special schools and universities at Bucharest and Jassy. A government high school of commerce was opened in 1913.

Cities.—Capital, Bucharest, has a population (1912) of about 500,000. Other towns are: Jassy, 80,000; Galatz, 66,000; Braila, 60,000; Ploesci, 50,000; Craiova, 46,000.

Bucharest (*Bucuresci*), the "Paris of the East," stands two hundred and sixty-five feet above sea-level, in the fertile but treeless plain of the small, sluggish Dambovitza. By rail it is seven hundred and sixteen miles southeast of Vienna, forty miles north of Giurgevo on the Danube, and one hundred and seventy-nine miles northwest of Varna on the Black Sea. Viewed from the hills which lie to the west and southwest, Bucharest presents a most striking appearance. It is sprawled out on both banks of the river, occupying more than twenty square miles of territory in the slight depression through which the stream makes its way.

Most of its houses are low, not more than two stories, with flat roofs that shimmer in the sun. High above them rise almost innumerable towers, cupolas and minarets of churches, in which the city abounds. The Catholic Cathedral is a fine edifice, built 1875-1884.

Great spots and stretches of greenery mark the spacious parks and gardens and the great boulevards, some of which extend along the river bank, others out to the distant sections of the city.

Three of these thoroughfares skirt the river on the left, where the greater part of the city lies. They are the Plevna, Lipcani and Vacaresci, in order. From the Lipscani extend the Elizabeth Boulevard and Calea Victorie, the avenue of Victory, which connect with another broad highway extending nearly around the city on its outskirts.

Parks and drives are frequent. Then there are the botanical and zoological gardens, and a racecourse, where meets are held at least twice a year.

In these streets the East meets the West. Women gowned in the latest Paris creations and men in perfect European dress are in contrast with the wandering bands of gypsies, the brilliant-clad Roumanian country folk come in to market, the fez-topped Turk, and the distinctly dressed Russian cabmen.

Besides the parkways and busy thoroughfares there are many beautiful buildings—the National Bank, the Athenaeum, with its collection of rare antiques dating back to the days of the Roman conquest; the National Library and Theater; the University of Bucharest, founded in 1864; the many other schools and academies; the great home for the blind established by the late Queen Elizabeth, better known by her pen name "Carmen Sylvia"; a hundred-and-one other places that go to make the city notable as a center of learning, culture and modern progress.

Nearly all of these institutions have homes that are masterpieces of architecture. The Treasury

Building and the Postoffice are notable examples. It is said that the Roumanian government has the finest home for its foreign ministry of any country in Europe.

Bucharest is the center for trade between Austria and the Balkan Peninsula, the chief articles of commerce being textile fabrics, grain, hides, metal, coal, timber, and cattle. It has been several times besieged; and between 1793 and 1812 suffered twice from earthquakes, twice from inundations, once from fire, and twice from pestilence.

History.—The Roumanians are descended from the ancient inhabitants—probably Thracians or Dacians—of the country, modified by elements derived from the Roman, Gothic, Bulgarian, and Slavonic invaders. Dacia was a Roman colony from 101 A.D. till 274, when it became the prey of successive swarms of wandering tribes.

Out of numerous small states, two, Wallachia and Moldavia, had become dominant, when they had to bow to the Turkish yoke, and became tributary to the Porte. They were governed by rulers nominated by the Porte, who were generally extortionate Greeks of Constantinople. Russian intervention during the eighteenth century somewhat improved the condition of the downtrodden principalities, which at times were wholly under Russian influence. In 1859 they elected the same prince, Couza. He ruled till he was deposed for misgovernment in 1866, and was succeeded by Prince Charles of Hohenzollern.

The Roumanians fought bravely on the Russian side in the Turkish war of 1877-1878, and at the end obtained complete independence, though they had to give Russia part of Bessarabia for the Dobruja. In 1881 the prince was recognized as a king.

Roumania is not a Balkan state, and took no part in the operations of the Balkan League (Bulgaria, Servia, Montenegro, and Greece) against the Ottoman Empire in 1912-1913; but during the second war (1913), when Bulgaria was in opposition to the remaining members of the League, Roumania was able to exact terms from Bulgaria at the Treaty of Bucharest, by which Bulgarian territory amounting to 7,609 square miles, with a population of 285,000, was surrendered to Roumania.

SERVIA (*ser'vi-ä*), the dominant state of Jugoslavia, southeastern Europe, is bounded by Austria-Hungary (separated by the Save and Danube) on the north, Roumania (separated by the Danube) and Bulgaria on the east, Turkey and Bosnia on the south, and Bosnia (mainly separated by the Drina) on the west.

Surface.—The greater part of the country is mountainous and wooded; it is full of forests and hills, hedged fields, and fresh meadows, forming pretty but never very grand landscapes. The principal river (besides the frontier rivers) is the Morava.

Production and Industry.—Nearly nine-tenths of the land is left under its primitive woods and pastures. The principal crops are maize for home consumption, and wheat for export; flax, hemp, and tobacco are also grown, and silk-culture is carried on to a limited extent. The exports consist of dried prunes, pigs, and wool, besides wheat, wine, hides, cattle, and horses. The bulk of the trade is with Austria. The mineral treasures of Servia are considerable; gold, copper, and zinc occur in the hills which reach towards the "Iron Gates" of the Danube, and coal beds extend along the river.

Fruit trees exist in very great abundance, especially plums, from which the brandy of the Servians (*slovovitza*) is extensively made.

People.—The Servians are a well-built, stalwart Slavonic (or perhaps in part Slavonized Albanian) race, proud and martial by temperament; the most striking feature of their social life is the family community or *Zadruga*. Their literature is rich in poetry, especially lyrics. The population, about 3,000,000 at the outbreak of the war of 1912-1913, was raised by conquests to about 5,000,000. Besides these the Montenegrins (450,000) are almost all pure Servians by race, as are also the Bosnians and Herzegovinians (2,000,000), not to speak of over 3,700,000 Servians in other parts of Austria-Hungary.

The people of Servia belong to the Greek Catholic Church. Education does not reach a very high standard, although a school exists in every commune. There is a university at Belgrade.

Government.—Servia is a constitutional and hereditary monarchy. The legislative power is vested in the king and the National Assembly. This last, called the *Skupshtina*, consists of one hundred and sixty deputies. Besides this body there is a senate of sixteen members, eight chosen by the king and eight by the National Assembly; this body acts as a permanent state council.

Cities.—Capital, Belgrade (*Biograd*, "White Fortress") at the confluence of the Save and Danube, is now a modern city, with electric railways and light, and wide streets, containing the university, national museum and library, and the old Turkish citadel. Population (1910) 91,000. It lies opposite Semlin, at the confluence of the Save and Danube, two hundred and fifteen miles southeast of Budapesth. The walls disappeared in 1862; the last and finest of the five gates was demolished in 1868. Year by year the town is losing its old Turkish aspect, becoming more modern, more European. The royal palace, the residence of the metropolitan, the national theater (1871), and the public offices are the principal buildings. Opposite the theater is a bronze monument to the murdered Prince Michael III.

Belgrade has but trifling manufactures of arms, cutlery, saddlery, silk goods, carpets, etc. It is, however, an entrepôt of trade between Turkey and Austria.

Other towns are Nish, 25,000; Kragojevatz, 19,000; Leskovatz, 15,000; Podjeravatz, 14,000; Shabatz, 12,000; Vranya, 11,500; Pirot, 11,000; and Krutchevatz, 10,000.

The principal towns in the territories acquired in 1913 are Monastir, 60,000; Prisrend, 42,000; Uskub, 32,000; Prilip, 24,000; Istip, or Shtip, 21,000; Kalkandelen, or Tetovo, 20,000; Koprili, or Veles, 20,000; Dibra, 16,000; Pristina, 16,000; Kumanovo, 15,000; Ochrida, 15,000; and Novi Bazar, 13,000.

History.—The Servians came from the Carpathians in the seventh century, and founded a great state, which, about 1350, embraced Albania and much of Bulgaria and Macedonia; but at Kossovo in 1389 the Turks crushed the Servian power and made Servia first tributary and then a province of the Ottoman empire.

A national rising had some success under Kara George in 1807-1810 and through Russian influence it was arranged that Servia should have some measure of internal autonomy. Still more successful was a rising in 1815 under Obrenovich. Under his successors there was considerable progress; and after the Russo-Turkish war of 1877-1878 Servia obtained complete independence and became a kingdom. King Milan abdicated in 1889.

In 1903 a party of officers, representing a wide conspiracy, assassinated King Alexander and Queen Draga, and Peter Karageorgevitch was proclaimed king. In 1913 Servia, as a member of the Balkan League (Bulgaria, Greece, Servia, and Montenegro), waged a successful war against Turkey. In August, 1913, Servia and Greece were attacked by Bulgaria, their former ally, owing to disputes concerning the division of the spoils. The second war collapsed in a few weeks through the threatened intervention of Roumania, and ended in the Treaty of Bucharest. Servia also became involved with the Austro-Hungarian monarchy on a question of the Albanian frontier, where desultory fighting had taken place for some months, but eventually the smaller power withdrew from the disputed area. The outcome of the military operations was the inclusion of the whole of "Old Servia" (the greater part of Macedonia) within the Servian boundaries, which thus embrace an area (1914) of close on thirty-four thousand square miles, with a population estimated at five million.

The assassination of the Austrian heir presumptive, in June, 1914, brought about an invasion of Servia by the forces of Austria-Hungary, and started the Pan-European war that raged until the armistice of Nov. 11, 1918.

SPAIN (Span. *España*), occupying the larger part of the southwestern peninsula of Europe, is bounded on the south and east by the Mediterranean, on the west by the Atlantic and Portugal, and on the north by the Bay of Biscay and France, from which it is separated by the Pyrenees. Its coast line extends 1,317 miles—712 formed by the Mediterranean and 605 by the Atlantic—and it comprises a total area of 196,700 English square miles, and a population (1910) of 19,588,688.

Surface.—The interior of the peninsula consists of an elevated tableland, surrounded and traversed by mountain ranges. The uniform coast line and the great elevation of its central plateau give Spain a more continental character in its extreme range of temperature than any of the other peninsulas of Europe.

Outside the plateau lie the highest summits in the country, the Pic de Néthou, in the Pyrenees, Mulhacen and Veleta in the Sierra Nevada, while the Picos de Europa in the Cantabrian Range attain over eight thousand feet. The plateau itself is traversed by four mountain ranges which separate the valley, of the Ebro from that of the Douro; and the whole of it has a general slight inclination from east or northeast to southwest. Hence all the considerable rivers except the Ebro flow westward to the Atlantic.

These include the Guadalaviar, Júcar, and Segura, important rivers of the eastern watershed. The Minho, Douro, Tagus, Guadiana, and Guadalquivir drain the western valleys, which are formed between the mountain ranges of the Peninsula. The Tagus is the largest river of the Peninsula, the estuary of which forms a magnificent harbor. The Guadalquivir, though the shortest of the larger streams, is the most important on account of its fullness and its course through the most extensive lowland of the Peninsula. The effect of the tide in it is felt for several leagues above Seville, to which city it is navigable, eighty miles from the sea.

The configuration of the country renders the climate very varied. In parts of the northwest the rainfall is among the heaviest in Europe. In the east and southeast occasionally no rain falls in the whole year. The rainfall in the western Pyrenees is very great, yet on the northern slope of the valley of the Ebro there are districts almost rainless. The western side of the great plateau, speaking generally, is more humid and much colder than the eastern, where irrigation is necessary for successful cultivation.

Production and Industry.—Galicia is almost a cattle country; Estremadura possesses vast flocks of sheep and herds of swine. The country is generally fertile, and well adapted to agriculture and the cultivation of heat-loving fruits—as olives, oranges, lemons, almonds, pomegranates, and dates. The agricultural products comprise wheat, barley, maize, oats, rice, with hemp and flax of the best quality. The vine is cultivated in every province; in the southwest, Jerez, the well-known sherry and tent wines are made; in the southeast, the Malaga and Alicante.

Spain is rich in iron, copper and lead, but the mines have been only partially developed.

The seat of the manufacturing industries is chiefly Catalonia. Cotton and woolen manufactures engage many hands, and there are also considerable silk, paper, and cork industries.

The principal exports are wine, copper and copper ores, lead, iron ores, olive oil, raisins, oranges, cork, esparto grass, wool, salt, quicksilver, grapes, etc.

People.—The basis of the population of the whole Peninsula is that of the old Iberians, modified by the admixture of Celtic, Phœnician, Roman, Germanic, and Moorish (Arab) invaders who from time to time gained ascendency in the land and became intermixed with the ancient inhabitants.

Until lately the only religion tolerated was that of the state, the Roman Catholic; now a certain tolèration is allowed to other denominations.

Education varies greatly among different classes and in different provinces. In the large towns and in some of the provinces a great effort is made to keep the higher and the technical schools on a level with the best in other European countries. In other parts the

neglect is very great. There are ten universities: Madrid, Barcelona, Granada, Oviedo, Salamanca, Seville, Santiago, Valencia, Valladolid, and Saragossa. Primary education is by law compulsory, but the law is not strictly enforced, which accounts for the large percentage of illiterates.

Government.—The government of Spain is an hereditary monarchy founded on the constitution of 1876. The Cortes consists of two bodies—the Senate, of about three hundred and sixty members (one-half elected), and a Congress of Deputies, elected at the rate of one member to every fifty thousand inhabitants.

Cities.—The principal cities are Madrid, population 597,573; Barcelona, 587,219; Valencia, 233,348; Seville, 155,366; Malaga, 136,192; Murcia, 125,380; Saragossa, 111,701; Carthagena, 96,983; Bilbao, 93,536; and San Sebastian, 92,514; and there are also twelve towns with over 50,000 inhabitants.

Madrid (Span. pron. *Madh-reedh'*), the capital of Spain, is situated in the department of Madrid (part of the ancient province of New Castile), eight hundred and eighty miles by rail from Paris. It is built on a treeless, ill-watered plateau, on the left bank of the Manzanares, two thousand and sixty feet above the sea-level.

The Manzanares is merely a mountain-torrent falling into the Jarama, a tributary of the Tagus; water is brought from the Guadarrama Mountains by an aqueduct forty-two miles in length.

The general aspect of the city is clean and gay, while the older parts are picturesque; no trace now remains of the mediæval city. The new streets are generally fine, broad, and planted with trees; the houses well built, lofty, and inhabited by several families living in flats. A great feature is the magnificent open spaces, chief of which is the Prado, running north and south through the eastern part of the city, and, with its continuations, three miles long. It contains four handsome fountains with groups of statuary, a fine obelisk to commemorate the gallant struggle with the French (May 2, 1808), monuments to Columbus, Isabel the Catholic, etc.

The picture-gallery here, founded by Charles III., is one of the finest in Europe, and contains many of the masterpieces of Velasquez, Murillo, Raphael, Tintoretto, Rubens, Teniers, and Van Dyck. Two other parks are the Buen Retiro, the fashionable promenade on the east of the city, and the Casa de Campo on the west. Midway between its extremities the Prado is crossed at right angles by the Calle de Alcala, the finest street in the city, about a mile in length, and leading from outside the fine triumphal arch rebuilt by Charles III. to the Puerta del Sol, the square which is the heart of Madrid; here converge the principal electric lines, and in it and the streets branching off from it are situated the principal shops and places of business.

THE ROYAL PALACE, MADRID,

one of the finest in Europe, has a frontage of four hundred and seventy feet, is one hundred feet high, and built of white stone. Among the thirty rooms on the first floor, the largest and finest is the Hall of the Ambassadors. The vault was painted by Tiepolo, and represents the exaltation of the Spanish monarchs. The walls are draped with velvet embroidered with gold, and twelve immense mirrors also decorate it. On the right of the throne, which is guarded by four gilded bronze lions, is a statue of Prudence, and on the left that of Justice. The chapel is extremely rich, but not very handsome. There is also a library, a theatre, and the magnificent collection of Flemish tapestries.

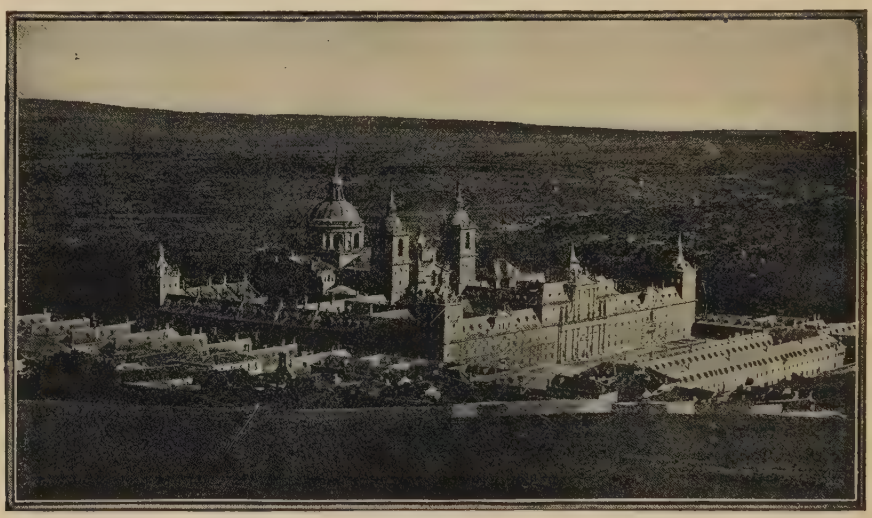
The finest square is the Plaza Mayor, formerly the scene of bull-fights; it contains a gigantic equestrian statue of Philip III., its founder. On the west of the city are the new cathedral and the royal palace; the latter, commenced in 1738 to replace the ancient Alcazar, which had been burned down, was finished in 1764 at a cost of fifteen million dollars. Other fine buildings are the palace of justice, formerly a convent; the houses of parliament; Buena Vista Palace, now the ministry of war, and the new national bank.

Besides a flourishing university, founded by Cardinal Ximenes, and two high schools, Madrid contains numerous municipal schools. Madrid

is well provided with newspapers and public libraries, the chief being the National Library, with more than half a million volumes, and the library of the university.

The opera house is one of the finest in the world; all the theaters must by law be lighted by electricity. The bull ring, situated outside the gates on the east, is a solid structure seating fourteen thousand.

Iron founding and the manufacture of furniture, carriages, and fancy articles are carried on on a small scale. The manufacture of tobacco employs many persons, chiefly women. The publishing trade is important, and books are well printed and cheap. The old tapestry factory still turns out beautiful work, as do the potteries at Moncloa.



THE ESCURIAL

is thirty-two miles from Madrid. It is called by the Spaniards the eighth wonder of the world. Philip II. built it in 1685 to commemorate the taking of St. Quentin, and to accomplish a vow which he made to St. Lawrence. This vast building has fifteen principal entrances, and more than one thousand one hundred windows. It is entirely built of granite, and its appearance is monotonous and cold. It contains a church, the Capilla Mayor, filled with royal monuments, the sacristy, a vast vaulted hall with a marble altar ornamented with bronze, the choir, and the pantheon or vault, where the kings of Spain are buried. The pantheon is reached by a magnificent staircase of colored marbles. The urn containing the remains of Charles V. was opened in 1870, and the body was even then in perfect preservation. The library of books and the manuscript library attracts the attention of scholars. The main entrance to the palace is in the middle of the north façade. The Hall of Battles, is covered with frescos representing Spanish conquests; and the apartments in which Philip II. lived and died. The Pavilion of Charles IV., called the Casa del Principe, is a charming little museum of paintings, sculptures, and mosaics. The King's Seat, where Philip II. came to sit when presiding over the work of the palace, is also to be seen.

History.—Spain was originally occupied by Iberian tribes (akin to the present Basque inhabitants of the north), who were partially overlaid by invading Celts. The Carthaginians established themselves in the south of Spain in the third century B. C. The Romans appeared in force in the next century, but it was not till after a fierce and prolonged resistance from Iberians and Celtiberians that, under Augustus, the Roman conquest was complete. Soon Spain, thoroughly Romanized, was contributing largely to Latin literature and Roman culture.

The Germanic invaders from the north, Suevi, Vandals, and Visigoths, crushed the Roman power in the fifth century A. D., and Spain became a province of the Visigothic kingdom (573 A. D.). Then followed the Moorish conquest, which was very rapid (714-732) and complete, except in the north and northwest. The several Christian kingdoms of Spain: Castile, Leon, Navarre, Aragon, etc., as well as Portugal—were formed by the gradual depression of the Moors; but Moorish Granada was not conquered till 1492, and Spain was not united under one rule till 1512.

Spain became a European state with the union of Ferdinand of Aragon and Isabella of Castile in 1469, and the New World was discovered for them. Under the Emperor Charles V., in the sixteenth century, Spain was the most important country in Europe; but the population was unequal to the drain upon it caused by constant warfare, emigration, and adverse economical and industrial conditions.

With Philip II., Charles's son, the decline of Spain set in, though now for sixty years Portugal was under the Spanish crown. The Bourbon dynasty brought complication in the wars of Louis XIV., and little advantage from the recovery of Naples and Sicily. The nadir of Spanish history is in the time of Napoleon, when Spain, in spite of some national efforts, was nominally a kingdom, but really a mere province of the French empire.

In spite of the valiant patriotism shown in resisting the French, and the ultimate recovery of national independence through the overthrow of Napoleon, the history of Spain in the nineteenth century was in the main inglorious. In Cuba there had been trouble since 1895, the final outcome of which was the disastrous Spanish-American war, leading to the loss of the greater colonies. The twentieth century has seen gradual recovery, grow-

ing toleration, a breach with the Vatican, revolutionary and repressive movements, and ambitions in northwest Africa.

In June, 1911, the situation in Morocco led to the dispatch of a Spanish force to Alcazar. But the indignation aroused in France at this action was quite overshadowed by the sensation caused when it became known that Germany had sent a warship to Agadir. Labor troubles in Spain broke out in September, 1911. Martial law was proclaimed throughout the country, and a royal decree suspended the constitutional guarantees, which were not re-established until October 22. In March, 1912, the ministry was reconstituted, but, in 1916, during the European war, again gave way over grave questions over neutrality and internal conditions.

SWEDEN (Swedish *Sverige*), a kingdom of northern Europe, occupies the eastern side of the Scandinavian peninsula. From 1814 till the amicable but definitive separation in 1905, it was associated with Norway under one crown. Its greatest length, north to south, is close to 1000 miles, its greatest breadth 300; its area 170,970 square miles; and its coast line 1550 miles. Besides many skerry islands, Sweden owns Gothland and Œland.

Surface.—The country may be generally described as a broad plain sloping southeastward from the Kjölen Mountains to the Baltic. The only mountainous districts adjoin Norway; the peaks sink in altitude from seven thousand feet in the north to three thousand eight hundred feet at the southern end of the chain. Immediately south of this point a subsidiary chain strikes off to the southeast, and, threading the lake region of central Sweden, swells out beyond into a tableland with a mean elevation of eight hundred and fifty feet and maximum of twelve hundred and forty feet. Fully two-thirds of the entire surface lies lower than eight hundred feet, and one-third lower than three hundred feet, above sea level.

Sweden is separated popularly and geographically into three great divisions—Norrland, Svealand, and Gothland. Norrland, in the north, is a region of vast and lonely forests and rapid mountain streams, often forming fine cascades and ribbon-like lakes before they reach the Gulf of Bothnia.

The central division of Svealand, or Sweden proper, is a region of big lakes, and contains most of the mines. Lakes occupy nearly fourteen thousand square miles, or eight and two-tenths per cent of the total area; several of the largest, as Vener, Vetter, Hjelmar, Mälar, are connected with one another and the sea by rivers and canals. Lake Mälar contains some thirteen hundred islands, many beautifully wooded, with royal palaces or noblemen's castles; and its shores are studded with prosperous towns, castles, palaces, and factories.

Gothland, the southern division, contains a much higher proportion of cultivated land, and its wide plains are all under agriculture.

Climate.—The climate of Sweden is continental in the north, along the Norwegian frontier, and on the southern plateau. The lakes in the colder districts of the north are ice bound for some two hundred and twenty days in the year; in the south only for about ninety days. The rainfall is greatest on the coast of the Cattegat.

Production and Industry.—The principal articles of cultivation are the various cereals—oats, rye, barley, wheat—and potatoes. The forests are very extensive, covering one-half of the surface of the country, and consisting of pine, birch, fir; these are of great importance, supplying timber, pitch, and tar, and also the chief fuel.

The mineral products are extremely rich: iron of excellent quality, that known as the Dannemora iron, being converted into the finest steel; gold and silver in small proportions; copper, lead, nickel, zinc, cobalt, alum, sulphur, porphyry, and marble. There is a railroad opening up the rich iron ore districts of Lapland, and mineral trains run from Gellivare and Kiruna to Lulea on the Gulf of Bothnia and to Narvik on the Atlantic. Considerable mines of coal are worked in Scania.

The chief articles of export are timber, butter, iron, steel, wood pulp, paper, matches, stone, iron and zinc ores, etc.

People.—The Swedes are a Germanic people, tall and strong, but with more variety of characteristics than the Norwegians. The Swedish language, allied closely to Norse and Danish, appears in very many dialects. It has had, especially since the sixteenth century, an extensive literature.

Almost the whole population is Protestant, adhering to the Lutheran Church, members of which alone are permitted to hold public offices. Education is well advanced in both countries, public instruction being gratuitous and compulsory. Sweden has the Universities of Upsala, which dates from 1477, and of Lund, founded in 1668, besides the many scientific and educational institutions of Stockholm.

Government.—The constitution of Sweden dates from 1809, but in 1866, when the separate meetings of the four estates—nobles, clergy, burghers, and peasants—were done away, the legislative system was much modified. The executive power is vested in the king, acting under the advice of a Council of State; the legislative in the two Chambers of the Diet, both of which are elected by the people—the first for nine years from proprietors, the second for three years from a lower class. The administration of justice is entirely independent of the government.

Cities.—The capital, Stockholm, has a population (1913) of 382,085. In addition to the capital, there are fourteen towns with above 20,000 population, viz.: Göteborg, 178,030; Malmö, 95,821; Norrköping, 46,180; Gefle, 35,736; Helsingborg, 37,385; Örebro, 33,182.

Malmö, on the sound opposite Copenhagen, is the outlet of the corn granary of the southern plain; Norrköping, on an inlet of the Baltic, after Stockholm, is the busiest manufacturing town of Sweden, its mills being driven by the rapids of the Motala; Gefle lies north of Stockholm, and is second only to it as a seaport on the Baltic side of the country; and Karlskrona, on the south coast, is the naval arsenal and headquarters of the fleet of Sweden.

PANORAMA OF STOCKHOLM, CAPITAL OF SWEDEN

Within recent years a network of railways has been formed over southern Sweden and Norway, connecting the capital towns with the ports of Göteborg, Malmö, and many other points.

Stockholm (*l* pronounced), stands on several islands and the adjacent mainland, between a bay of the Baltic and Lake Mälar, in a situation that is accounted one of the most picturesque in Europe.

Its nucleus is an island in mid-channel called "the Town"; on it stand the imposing royal palace; the chief church (St. Nicholas), in which the kings are crowned; the House of the Nobles; the town house; the ministries of the kingdom; and the principal wharf, a magnificent granite quay, fronting east.

Immediately west of the central island lies the Knights' Island (*Riddarholm*); it is almost entirely occupied with public buildings as the old Houses of Parliament; the old Franciscan church, in which all the later sovereigns of Sweden have been buried; the royal archives, and the chief law-courts.

North of these two islands lie the handsomely built districts of Norrmalm, separated from them by a narrow channel, in which is an islet with the new Houses of Parliament. In Norrmalm are the National Museum with valuable prehistoric collections, coins, paintings, sculptures; the principal theaters; the Academy of Fine Arts; the barracks; the Hop Garden, with the Royal Library, two hundred and fifty thousand volumes and eight thousand manuscripts, and with the statue of Linnæus; the Academy of Sciences; the Museum of Northern Antiquities; the Observatory, etc.

Ship Island (*Skeppsholm*), immediately east of "the Town" island, is the headquarters of the Swedish navy, and is connected with a smaller island on the southeast, that is crowned with a citadel. Beyond these again, and farther to the east, lies the beautiful island of the Zoological Gardens. Immediately south of "the Town" island is the extensive district of Södermalm, the houses of which climb up the steep slopes that rise from the water's edge. Handsome bridges connect the central islands with the northern and southern districts; quick little steamboats go to the beautiful islands in Lake Mälar on the west, and eastward toward the Baltic Sea, forty miles distant.

Sugar, tobacco, silks and ribbons, candles, linen, cotton, and leather are produced, and there are large iron foundries and machine shops. Though the water approaches are frozen up during winter, Stockholm exports iron and steel, oats and tar.

Stockholm was founded by Birger Jarl in 1255, and grew to be the capital only in modern times.

History.—Sweden was originally occupied by Lapps and Finns, but probably (1500 B. C.) Teutonic tribes drove them into the forests of the north, and at the dawn of history we find Svealand occupied by Swedes (Svea) and Gothland by the Goths.

Gothland was christianized and also conquered by the Danes in the ninth century, while Svealand remained fanatically heathen till the time of St. Eric (twelfth century), who conquered Finland, henceforth a Swedish possession. For a century Goths and Swedes had different kings, but gradually melted into one people toward the end of the thirteenth century.

Now arose bitter feuds between king, nobility, peasants, and universal turbulence prevailed; agriculture, industry, literature and culture progressed not at all or hardly existed. Even after the union of Sweden, Norway, and Denmark under one monarch (1397), Sweden was torn by conflicts which lasted down to the expulsion of Danish oppressors, and the restoration of Swedish autonomy by the national rising under Gustavus Vasa (1524), the ablest prince who had yet ruled the Swedes. Under him the reformation was heartily

GUSTAVUS ADOLPHUS PLACE AND THE ROYAL THEATER, STOCKHOLM

accepted. Gustavus Adolphus and the Swedes were its bulwark, not merely at home but in Germany in the Thirty Years' war; and by the acquirement of Bremen, Verden, and Pomerania, Sweden became (1648) a member of the empire.

Under Charles XII. and his successor, the enmity of Denmark, Poland, and Russia wrested her new conquests from Sweden, and gave Livonia, Esthonia, Ingermanland, and Karelia (which had long been Swedish) to Russia; thus reducing Sweden from the rank of a first-rate European power. After a bloody struggle Sweden had to cede Finland (1809) to Russia. Norway was united by a personal union (i. e., by the monarch) with Sweden in 1810; and in 1818 the French general Bernadotte was elected king (as Charles XIV.).

Norway's demand for a larger measure of home rule led in 1905 to a complete separation.

NEW UNIVERSITY, UPSALA, SWEDEN

Upsala is best reached by boat from Stockholm. Here the celebrated university, founded 1477, by Jacob Ulfson, now magnificently housed, stands in the Drottninggatan. Library, the largest in Sweden, with three hundred thousand volumes, including the Codex Argenteus, or Gothic Gospel of Bishop Ulphilas (318-388), written in silver letters on purple vellum, also the Atlantica of Rudbeck, and the sacred book of the Druses, with the Edda Manuscript. An Observatory is attached to the University. The Botanical Garden has many rare plants and a bust of Linnæus (Linné), who was professor and physician here, living at Hammarby.

SWITZERLAND (Ger. *Schweiz;* Fr. *Suisse*). is a confederation of twenty-two cantons, lying practically in the very center of Europe, between France, Germany, Austria, and Italy. No part of it is within one hundred miles of the sea. It is also a very small country (sixteen thousand square miles), not much larger than the half of Scotland. The greatest length from east to west is two hundred and sixteen miles, the width from north to south being one hundred and thirty-seven miles. The population in 1910 was 3,741,971.

Surface.—The southern boundary lies for the most part along the highest crests of the Alps, which descend by the Italian valleys to the plain of Lombardy; the summits of the Matterhorn and Monte Rosa rise on the boundary line, which is crossed by the Great St. Bernard, Simplon, and Splügen passes. North of this mass of heights the deep valleys of the Upper Rhone flowing west to the Lake of Geneva, and of the Upper Rhine flowing northeast to that of Constance, mark a deep trench all across the country. In the heart of the country rises the mass of the Bernese Alps or Oberland, the Alps of Uri and Glarus, with the summits of the Finsteraarhorn and Jungfrau. Still farther north the country descends gradually by less elevated mountains and hills to the undulating lowland of Switzerland (still one thousand five hundred feet above the sea), which extends in a curve from the Lake of Constance on the northeast along the Valley of the Aar, by the Lakes of Biel (Bienne) and Neuchâtel to that of Geneva. Beyond this the long parallel ranges of the Jura close in the country on the northwestern frontier.

More than half of the whole country is covered by rocks, glaciers, forest, and mountain pasture, and cannot be permanently inhabited.

Rivers and Lakes.—All the northern part of the country belongs to the basin of the Rhine flowing to the North Sea. That river, having purified its waters in its passage through the Boden-See or Lake of Constance (partly in Switzerland), is joined by the Aar, which rises near the Grimsel, and flows through the lakes of Brienz and Thun. To this basin also belong the lakes of Zürich and Zug, Luzerne, Neuchâtel, and Biel or Bienne. The southwestern district drains by the Rhône to the Mediterranean, through the Lake of Geneva or Leman, which is partly in Switzerland, partly in France.

The smaller part of the southern boundary that laps over the Italian valleys of the Alps includes the head of Lake Maggiore, in Switzerland, and the upper Ticino, which flows through it to the plain of Lombardy and the Adriatic. In the east the boundary embraces only one valley, which drains to the Danube, the Engadine, through which the Upper Inn flows northeastward.

From the elevation at which they rise, and their rapids, the rivers of Switzerland are of no value in navigation. The Rhine only begins to be freely navigable at Basel, where it leaves the country. The larger lakes, however, have little steamers plying from shore to shore; that of Geneva, forty-seven miles long, has a considerable traffic.

Climate and Scenery.—The climate naturally varies with the elevation above the sea level, from that of the perennial snows at an elevation of about nine thousand feet, downward through the pastoral alpine region and the tall pine forests, to the lower lands in which the chestnut flourishes, and where orchard fruits, the vine, mulberry, and wheat can be grown. There is a variation of about thirty-four and one-half degrees in the mean temperature—between fifty-four and one-half degrees Fahrenheit at Bellinzona, and twenty degrees on the Theodule Pass.

Switzerland has been called the playground of Europe, and is visited by large numbers of tourists from all parts of the world, attracted by its magnificent mountain and lake scenery. The amount of money brought annually by tourists is estimated at twenty million dollars.

Geneva and Lausanne, on the beautiful lake of Geneva, Interlaken (between the lakes of Thun and Brienz), Luzerne and the Rigi, Schaffhausen at the Rhine fall, Zermatt beneath Monte Rosa, Lugano in the heart of the Italian lake district, are notable tourist stations; St. Moritz in the Engadine, and Leuk (Louèche) in the Rhône Valley, Pfäffers in that of the Upper Rhine, are famous for their baths. Switzerland as a whole — with its mountains, lakes, glaciers, waterfalls, valleys and cites—has been described by an American poet as a "cluster of delights and grandeurs."

STATUE OF TELL, ALTDORF, SWITZERLAND

Altdorf, near the southern end of Lake Luzerne, and capital of the canton of of Uri, is in the mountain-walled valley, and is the reputed scene of Tell's shooting the apple. The side is marked by a fountain. The colossal statue of Tell is near by. His birthplace, near Bürglen, is occupied by a frescoed chapel.

Production and Industry.—The forests, which cover about a sixth of the surface, are of immense value to the country, where most of the houses are built of wood. The mountain pastures give the characteristic employments of the people of the Alps and Jura, as herdsmen and shepherds, tending their cattle and making cheese in the mountain châlets during summer.

Agriculture is followed chiefly in the valleys, where wheat, oats, maize, barley, flax, hemp, and tobacco are produced.

The textile industries are the most important, the chief centers being Zürich, Basel, Glarus, and St. Gall. The chief are silk, cotton, and linen fabrics, besides raw silk. Next comes the clock and watchmaking industry, established at Geneva in 1587, which spread to the cantons of Neuchâtel, Berne and Vaud.

Wood carving was introduced in the Oberland about 1820. Other manufactures are chemicals, chocolate, and condensed milk.

Salt, obtained on the banks of the Rhine, is the only valuable mineral of the country.

People.—Three-fourths of the population of Switzerland, occupying all the center and north of the country, are Germanic; the remaining fourth belongs to three branches of the Romanic family—the French in the west, the Italian in the south, and the Rhœto-Romanic in the southeast. A little more than half of the population is Protestant, the remainder, chiefly in the mountain region, Roman Catholic.

Education is widely diffused, especially in the Protestant districts of the northeast, where the law of compulsory education is rigidly enforced. There are universities at Basel, Berne, Zürich, Geneva, and Lausanne.

Government.—At the close of the political storms which raged in Europe from 1789 till 1815, the affairs of Switzerland were re-arranged by the Congress of Vienna, which provided for the perpetual neutrality and independence of Switzerland in its twenty-two cantons. Since 1848 the independent states or cantons of Switzerland have become a united confederacy (Bundes Staat), the supreme legislative and executive authority of which is vested in a parliament of two chambers, sitting at Berne—the Stände Rath or States Council, and the National Rath, the first composed of two members for each canton, the second of representatives of the people according to numbers. The cantons are still, however, in a great measure, independent democracies, each making its own laws and managing its local affairs.

Referendum and Initiative.—These are two political institutions peculiar to Switzerland, the furthest developments of democracy yet attained.

The referendum, which has now spread throughout the whole Confederation, and by means of which all legislative acts passed in the Federal or Cantonal Assemblies may be referred to the people *en masse*, was fully developed in 1874, and it has been put in operation on an average once a year. The decisions have generally shown a conservative rather than a radical tendency on the part of the people.

Initiative is the exercise of the right granted to voters to initiate proposals for the enactment of new laws or for the alteration or abolition of the old ones.

Cities.—The capital of the Swiss Confederation is Berne, population (1910) 85,650. In 1910 there were twelve communes with populations exceeding 20,000: Zürich, 190,733; Bâle, 132,280; Geneva, 123,160; Berne, 85,650; Lausanne, 63,296; St. Gall, 37,657; Chaux-de-Fonds, 37,626; and Luzerne, 39,152.

THE BERNE CATHEDRAL

was built in 1421-1573, and restored in 1850, with a richly sculptured portal, some good stained glass of the fifteenth century, and a famous organ. From the Terrace in the rear of the Cathedral, the snowy peaks of the Bernese Alps are seen in a glorious panorama.

Berne, since 1849 the capital of Switzerland, sixty-eight miles by rail southwest of Basel, is situated on a lofty sandstone promontory formed by the winding Aar, which surrounds it on three sides. It is one of the best and most regularly built towns in Europe, as it is the finest in Switzerland. The houses are massive structures of freestone, resting upon shop-lined arcades. Rills of water flow through the streets. The view of the Alpine peaks from the city is magnificent.

The principal public buildings are a Gothic cathedral, the magnificent Federal Council Hall, the mint, the hospital, and the university. Berne has an interesting museum, and a valuable public library of fifty thousand volumes.

It was founded in 1191, was made a free imperial city in 1218, under Frederick II.; and between 1288 and 1339 successfully resisted the attacks of Rudolf of Hapsburg, Albert, his son, and Louis of Bavaria. The "Disputation of Berne" between Catholics and Reformers in 1528 prepared the way for the acceptance of the reformed doctrine.

On account of the traditionary derivation of its name (Swabian *bern*, "a bear"), bears are maintained in a public bear-pit.

History.—The original inhabitants of Switzerland were the Celtic Helvetii, and the Rhætii of doubtful affinity. Both were conquered by Julius Cæsar and the generals of Augustus, and Romanized. Overrun by the Burgundians in the west, and their Germanic kinsmen the Alemannians in the east, Helvetia became subject to the Frankish kings and were christianized in the seventh century.

Most of the country was subsequently part of the Holy Roman Empire; and in 1273 a Swiss noble, Rudolf of Hapsburg in Aargau, became German emperor. Soon after his death (in 1291) the inhabitants of Uri, Schwyz, and Unterwalden formed a league to defend their common interests, and in 1315 crushed an Austrian army at Morgarten. In 1332 Luzerne joined the alliance, and in 1353, Berne, Zürich, Glarus, and Zug. The Austrians were again routed in Sempach in 1386, and in 1388 at Näfels.

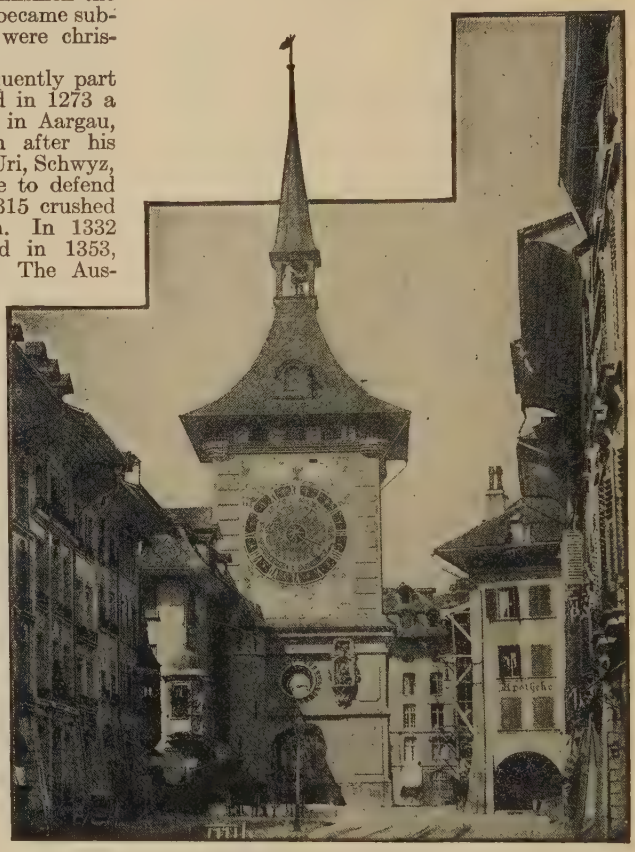
The Swiss next had a fierce but triumphant struggle with Charles the Bold of Burgundy, whom they routed at Grandson and Morat in 1476, and finally at Nancy (where Charles was slain) in 1477.

When the Reformation began there were thirteen cantons, and the cantons took opposite sides from the beginning, not without serious turmoil and bloodshed. The treaty of Westphalia in 1648 recognized Switzerland as an independent state. Some of the cantons were strictly aristocratic and some highly democratic, and there was much discontent long before the French Revolution, when, in 1798, between civil strife and French armies, the old republic (or rather alliance) came to an end.

The Helvetic Republic of nineteen cantons, under French auspices, endured till 1805; then a new republican constitution was adopted, the Federal Pact of twenty-two cantons. On Napoleon's downfall, Valais, Neuchâtel, and Geneva, which had been incorporated with France, were restored, and Swiss neutrality and inviolability were recognized by the treaty of Vienna in 1815. Religious troubles led to a Catholic league in 1844, which was suppressed by the Federal forces in 1847. The present constitution was adopted in 1848, but revised in 1874. In 1891 a demand for popular initiative for measures was carried. In 1908 Switzerland entered into an international convention for compulsory arbitration at the court of the Hague.

TURKEY, or Ottoman Empire, comprises the wide but heterogeneous territories really or nominally subject to the Osmânlî Sultan, in Europe, Asia, and Africa. These territories, which once extended from the Danube to the cataracts of the Nile, and from the Euphrates to the borders of Morocco, have been greatly reduced in the nineteenth and twentieth centuries.

Asiatic Turkey is now the true center of gravity of the empire; it includes Anatolia (the great plateau of Asia Minor), the lowlands of Mesopotamia, the highlands of Kurdistan and Armenia, and the island of Samos.



BERNE CLOCK TOWER,
famous for its Bear Chimes—figures which perform every time the clock strikes.

The total area of the empire has been estimated as follows:

Area in Square Miles

Turkey in Europe	12,000
Turkey in Asia:	
Anatolia	193,800
Armenia and Kurdistan	72,600
Mesopotamia and Syria	244,460
Turkish Arabia	172,000
Total	694,860

Estimated Population

Turkey in Europe	2,755,000
Turkey in Asia:	
Anatolia	9,175,000
Armenia and Kurdistan	2,500,000
Mesopotamia and Syria	4,650,000
Turkish Arabia	1,100,000
Total	20,150,000

Of the above totals only 700,000 square miles (with a population of 21,000,000) are directly under Turkish government.

European Turkey consists of the provinces of Adrianople, Constantinople and Chatalja, and is separated from Asia by the Bosphorus at Constantinople and by the Dardanelles (Hellespont), the only political neighbor being Bulgaria, on the northwest.

PANORAMA OF THE BOSPHORUS AT THE NARROWEST PART

The Bosphorus, the straight connecting the Sea of Azov with the Black Sea, is so-called after Io, who swam over it in the shape of a heifer. On the western shore is the city of Constantinople. The Bosphorus at this point is about five hundred and fifty yards wide.

Physical Features.—Turkey in Europe is a mountainous country and the chief physical features as it is now limited is the strait of Bosphorus and the Dardenelles. The Bosphorus, which guards the approach to the Black Sea from the Sea of Marmora, is at the same time the focus of all maritime trade between the Mediterranean and Russia, etc., as well as of the overland routes from Europe into Asia Minor. It has fitly been likened to a tortuous river valley over whose wooded banks are scattered forts and towers, cities and villages, castles and parks. The southern gate of the Sea of Marmora is the Dardanelles, which gives an opening into the Ægean.

Turkey in Asia is still more mountainous. The two almost parallel ranges, Taurus and Anti-Taurus, which are the basis of its mountain system, cover almost the whole of the peninsula of Asia Minor or Anatolia with their ramifications and offshoots, forming the surface into elevated plateaus, deep valleys, and enclosed plains. From the Taurus chain the Lebanon range proceeds southwards parallel to the coast of Syria, and, diminishing in elevation in Palestine, terminates on the Red Sea coast at Sinai.

The Euphrates, Tigris, Orontes, and Kizil-Ermak are the chief rivers. (See Asia Minor.)

Climate.—The climate of Turkey in Asia is as varied as the physical features. The great plateau on the north has a distinctly continental climate, rigorous severe winters with intense scorching heat in summer; in the eastern part of the plateau region the mountains are covered with snow for two-thirds of the year, and some of the principal ranges are capped with perpetual snow; here the peasants build their dwellings underground to escape the severity of the seasons. Towards the west the winters are not quite so severe, but the variations of temperature are excessive.

Products and Industry.—The soil of European Turkey is for the most part very fertile, and the cultivated products include most of those usual in central and southern Europe—maize, rice, rye, barley, millet, besides tobacco madder, and cotton. The mineral products are iron in abundance, argentiferous lead ore, copper, sulphur, salt, alum, and a little gold; some deposits of coal have been found, but none are worked. Sheep-breeding is largely carried on.

In Asiatic Turkey the mineral wealth is great; coal and iron are found together in considerable quantities; rich mines of copper exist in the mountains on the south of the Black Sea, and in the Taurus near Diarbekr lead and silver are found at intervals along a line connecting Angora, Sivas, and Trebizond in the north, and the eastern Taurus in the south; green, black, and white marble, and the finest quality of granite, are to be had in many parts of the mountain section.

With a fertile arable soil and a suitable climate, nearly every agricultural product flourishes. Oats, barley, and wheat are produced in great abundance. Almost all kinds of garden produce and orchard fruits abound, grapes and oranges are to be had all round the Mediterranean coast, as well as the choicest tobacco, opium, valonia and madder.

The mulberry is everywhere cultivated for feeding the silkworms, and cotton is grown in most of the western valleys. Vast groves of boxwood and other valuable trees clothe the seaward slopes of the hills. Dates are produced for export in the Babylonian plain, where wheat is indigenous. Petroleum and bitumen springs are found in the Euphrates valley.

Angora is famous for its flocks of goats, which produce the mohair of commerce, and enormous quantities of wool come from the countless flocks of sheep tended by the wandering Bedouin and Kurd shepherds.

There are at present no manufactures worth mention. The sponge fisheries of the Mediterranean are a source of great wealth.

Commerce.—The exports include tobacco, cereals, fruits, silk, opium, mohair, cotton, coffee, skins, wool, oil-seeds, valonia, carpets, etc., and are largely derived from the Asiatic provinces. Recently large quantities of wine and of raisins for the manufacture of wine have been exported. Since the establishment of the Anatolian railway by German enterprise the export of cereals, chiefly malting barley, has largely increased.

People.—The population consists of a singular mixture of races. Turks, Greeks, Slavs, and Albanians are largely represented, besides Armenians, Kurds, Arabs, Tartars, Jews, Circassians, and Frank residents. (See Book of Races.)

The established religion is Islam or Mohammedanism, but most other creeds are recognized and tolerated. The Protestant religion was for the first time officially recognized in 1845.

Education in all departments has of late been notably improved and has largely contributed to the complete overthrow of the antiquated and despotic system of government.

Government.—Until 1908 the government of Turkey was a pure despotism. An amazing change was swiftly and peacefully carried through in the autumn of that year. In connection with the troubles in Macedonia between Christians and Moslems, Greeks and Bulgarians, a Turkish military revolt took place, which, under the guidance of the "Young-Turkish" party (mostly educated abroad), became a great national movement. The sultan, overawed, had to acquiesce; parliamentary government was planned and carried out; equality before the law proclaimed to all races and religions of the empire; and a large measure of local self-government promised not merely to Turks but to Greeks, Bulgarians, Albanians, Armenians, Syrians, Kurds and Arabs.

The enormous difficulties of the crisis were complicated by Bulgaria proclaiming its independence, and Austria-Hungary annexing the provinces of Bosnia and Herzegovina. But government by a national assembly has taken root in Turkey.

The term "Sublime Porte," sometimes given to the Turkish government, is derived from the name of the chief gate of Constantinople.

Cities.—Of the towns by far the most populous is the capital, Constantinople (1,200,000), while after it come Adrianople (83,000), which by reason of its central position in the Maritza valley, commands an extensive inland commerce, Midia, and Gallipoli, the chief port on the Dardanelles.

The principal towns of Asiatic Turkey are Smyrna, 260,000; Bagdad, 150,000; Damascus, 150,000; Aleppo, 125,000; Beyrout, 120,000; Scutari in Anatolia, 80,000, and Broussa, 80,000.

Constantinople was founded in 330 A. D. by Constantine the Great, from whom it derives its name, on a site partly occupied by the ancient Greek colony of Byzantium. The Turks call it Istambol or Stambol.

The city stands on a hilly promontory of triangular shape, having the Sea of Marmora and the Bosphorus on the south and east, and on the north the Golden Horn, an arm of the Bosphorus. It is thus surrounded by water on all sides but the west, where a strong wall shuts the city off, from the mainland. Like Rome, the city is built on seven hills, six of them being separated portions of one long ridge.

As in the case of all great cities, Constantinople has spread far beyond its original bounds, and may be said to include towns originally quite separate from itself.

Constantinople is excellently situated, more advantageously, perhaps, than any European city but Naples.

From the outside its appearance is most picturesque and imposing. At the taking of the city in the fifteenth century most of the churches were destroyed, and mosques were erected in the most prominent situations. Cupolas and minarets, with graceful curves and soaring spires, combine with lofty cypresses to give the city an air of unique grace, and to invest it with the mysterious glamour of the oriental world.

Within, however, the appearance is not so pleasing. The streets form a labyrinth of dirty, crooked, and ill-paved alleys, while most of the houses are low and are built of wood or rough stone. During the last half century the aspect of things has become much more European. The streets, under western influence, have been widened and improved, lighting at night is common, and a European style of building has been introduced, even for the sultan's palace. Cabs and electric cars are to be seen in most parts, while the old camel service has entirely disappeared. The dress of the people has changed in the same direction. The streets are generally dull in appearance, almost all animation being concentrated in the bazaars.

Constantinople consists of two distinct parts, besides more distant suburbs—Constantinople proper or Stambol, and what may be termed Christian Constantinople because it is there that the Christian colonies chiefly congregate. The two are separated by the Golden Horn, a safe harbor, capable of accommodating twelve hundred vessels, and so deep that the largest ironclads of the Turkish navy find enough water for their draught quite close to the shore.

Stambol or Turkish Constantinople lies on the south side of the Golden Horn, and Christian Constantinople lies on the north side; the two are connected by bridges. Stambol is on the site of Byzantium, and the old walls run a circuit of fourteen miles from the grim but now ruined and disused castle of the Seven Towers—where many sultans met thier deaths at the hands of their mutinous soldiery, and where foreign ambassadors were imprisoned upon declaration of war—to the Golden Horn, then along its south shore to Seraglio Point, and so back to the Seven Towers, close along the margin of the Propontis. Here are nearly all the monuments and antiquities worth seeing in Constantinople.

First, next the Seraglio, stands Agia Sophia, Saint Sophia, the church dedicated by Constantine to "Eternal Wisdom," and rebuilt with added splendor by Theodosius and by Justinian, and now converted into a cathedral mosque. Outside it is not worth a second glance, but within, the airy grace of its stupendous dome, and the beauty of its marbles and mosaics fascinate and amaze the vision.

Next, but not less beautiful, is the Suleymaniya, the mosque which the Great Suleyman and his

PANORAMA OF CONSTANTINOPLE

As the steamer runs up the Bosphorus, the white buildings and glittering minarets of Constantinople come into view; with the mosque of Santa Sophia, Galata Tower and Pera, the Sultan's Palaces at Beshiktash, with Scutari Suburb on the right, and then, rounding Seraglio Point, it glides at half speed into the Golden Horn, or harbor of Constantinople. At this moment, if the weather be fine and clear, a striking panorama opens to the eye of the voyager. The Golden Horn divides the city into two sections; Stamboul to the left, and Galata and Pera to the right. It is a bay, or amphitheater, surrounded by hills which are covered with buildings, domes, minarets, and palaces, embosomed by cypress groves, with hundreds of vessels and caiques skimming in all directions.

architect Sinan erected on the model of St. Sophia, but with Saracenic ornament and a loftier though not quite so expansive dome. Some of the monolithic colums are remarkable for their size and beauty, and the general effect is even more imposing than that of St. Sophia,

Scarcely less stately is the Mosque of Sultan Ahmed I. in the Hippodrome; distinguished without by its six minarets (instead of the usual four), and within by the four gigantic columns which support the dome. Here the official celebrations and formal processions take place at the great festivals.

The mosque of the conqueror, Mohammed II., is also notable, though it has been greatly altered in restoration.

There are altogether some eight hundred mosques in Constantinople, and numerous chapels; but very few of them present features of special interest, except sometimes in the beauty of their wall tiles, of the Rhodian style, for the manufacture of which the suburb of Eyyûb was famous.

The remains of the Greek churches are more interesting, and the Fanar, or Greek quarter of Stambol, recall the memories of many distinguished Fanariote statesmen; but among the relics of ancient Constantinople none is more striking than the Hippodrome or "Horse Manége", originally a circus surrounded by marble seats, long since removed, but still showing remains of antiquity, such as the famous column of the Three Serpents which once stood at the Temple of Delphi, and supported a gold tripod made out of the spoils taken by the Greeks at the battle of Platæa, but was removed to his new capital by Constantine.

Christian Constantinople, on the north side of the Golden Horn, comprises Galata, Pera, and Tophâna. Galata is pre-eminently the merchant quarter, founded by a colony of Genoese merchants in 1216. The Tower of Galata, a Genoese erection, serves the same purpose as the Seraskier's Tower on the opposite side in giving alarms of fires. A tunnelled railway drags passengers up the steep ascent to Pera.

Pera is the aristocratic quarter; here are all the embassies and consulates. The steep and badly paved Grande Rue is lined with fair if expensive shops, and has an opera house, many cafés and restaurants, besides most of the principal hotels. Turks preponderate at Tophâna, which is so named from its cannon foundry.

The magnificent palace of Dolmabagché is on the brink of the Bosphorus. Other suburbs are Kâsim Pasha, on the Golden Horn, the seat of the admiralty; Hasköi, and the picturesque village of Eyyûb.

Along the European shore of the Bosphorus are the summer resorts of Therapia and Biyukderé.

The Asiatic shore is also lined with settlements from Scutari to Candili. The new palace of Yildiz Köshki stands at the top of the hill of Beshiktâsh, beyond Pera.

The commerce of Constantinople is increasing rapidly, though most of it is in the hands of foreigners, especially of Greek and Armenian merchants. Exports are chiefly cereals, carpets, silk, wool, hides, and all kinds of refuse and waste materials such as horns, hoofs, skins, bones, old iron, etc. Several hundreds of tons of the sweetmeat known as "Turkish delight" are also sent yearly to countries of Europe and America.

The manufactures have all taken their rise during the last twenty years or so, and even now only that of cloth making has made much headway.

ENTRANCE TO DOLMA-BAGTCHE PALACE

This palace, on the shore of the Bosphorus, was built and inhabited by Abdul-Medjid (1839-1861), is beautifully decorated in the interior and has a splendid throne room.

History.—The Osmanlis or Ottoman Turks sprang from a small clan of the Oghuz, who assisted the Seljûk sultan of Iconium, early in the thirteenth century, to resist the Mongol avalanche.

In the fourteenth century, the Turks under Osmân or Othmân conquered the Seljûk kingdom, and became known as Osmânlîs or Ottomans. By 1336 they pushed their way to the Hellespont; under Murâd I. (Amurath) they occupied Adrianople and Philippopolis, received homage from the kings of Servia and Bulgaria, and practically held all the Balkan peninsula except Constantinople, which, after much fighting, fell before Mohammed II. in 1453. In the same century they conquered Albania, Greece, and the Crimea; and in the sixteenth century Syria, Egypt, Tunis, Hungary, and South Russia, and had wars with the Russians, Persians, and Venetians.

Their star began to decline in the seventeenth century; in 1682 they were driven back from Vienna, and lost Hungary, Transylvania, and Podolia. In the eighteenth century the Russians were their most successful enemies, wresting from them the territories from the Dniester to the Caspian. Greece attained independence in 1828, though Egypt failed to throw off its allegiance. The Crimean war (1854-1857) was fought in aid of the Turks against the Russians.

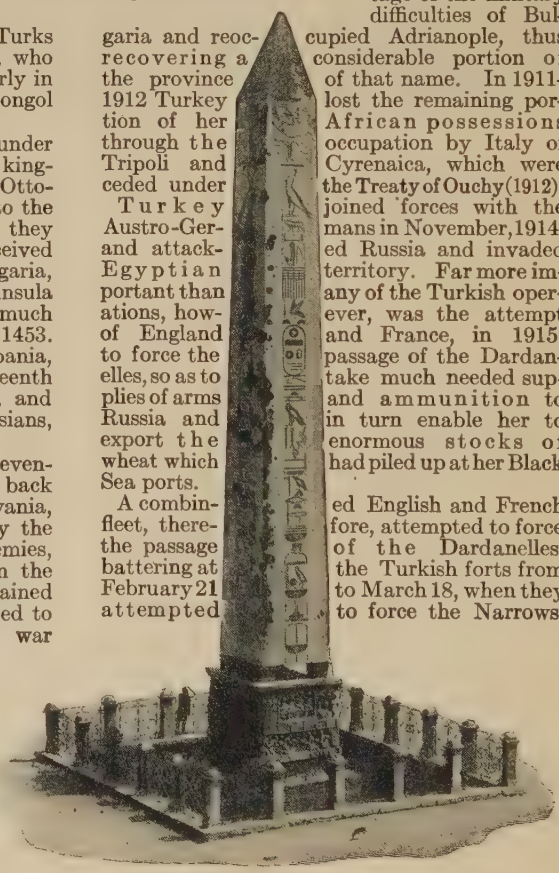
The next great crisis was the Russian war of 1877-1878. The worst Armenian massacres were in 1895-1896. Turkey held her own against Greece in 1897.

Abdul Hamid was deposed and constitutional government nominally established in 1908. But unrest and intrigue still prevent settled conditions.

Until the disastrous war of 1912-1913 with the States of the Balkan League (Bulgaria, Greece, Servia, and Montenegro) the European dominions of Turkey extended westwards to the Adriatic and northwards to Bosnia-Herzegovina (Austria). Under the Treaty of London in 1913 the northwest portion of Turkey was a line drawn from Enos, in the Ægean, to Midia, in the Black Sea, thus excluding Adrianople, which had capitulated to the Bulgarians after a prolonged siege.

During the second Balkan war (Bulgaria against the other members of the Balkan States) Turkey took advantage of the military difficulties of Bulgaria and reoccupied Adrianople, thus recovering a considerable portion of the province of that name. In 1911-1912 Turkey lost the remaining portion of her African possessions through the occupation by Italy of Tripoli and Cyrenaica, which were ceded under the Treaty of Ouchy (1912). Turkey joined forces with the Austro-Germans in November, 1914, and attacked Russia and invaded Egyptian territory. Far more important than any of the Turkish operations, however, was the attempt of England and France, in 1915, to force the passage of the Dardanelles, so as to take much needed supplies of arms and ammunition to Russia and in turn enable her to export the enormous stocks of wheat which had piled up at her Black Sea ports.

A combined English and French fleet, therefore, attempted to force the passage of the Dardanelles, battering at the Turkish forts from February 21 to March 18, when they attempted to force the Narrows,



EGYPTIAN OBELISK, CONSTANTINOPLE

This Obelisk from Thebes, of rose colored granite, sixty feet high. was transported hither by Theodosius the Great, A. D. 390-395, and shows traces of bas-reliefs of that date, and Egyptian hieroglyphs thirty centuries old.

YILDIZ PALACE AND THE BEAUTIFUL HAMIDIEH MOSQUE,
in the Beshiktash suburb, some distance north of Galata. The present Sultan resides in the Palace of Yildiz.

but were repulsed, with the loss of the British battleships *Irresistible* and *Ocean*, and the French battleships *Bouvet* and *Gaulois*, in addition to serious injury to a number of other warships engaged.

A joint land and sea expedition was subsequently sent to accomplish what the fleets had failed to achieve.

The most desperate fighting continued there from the beginning of May. The allies employed British and French regulars—the famous Foreign Legion of France, British colonials from Australia and New Zealand, and troops from Egypt, the Soudan and North Africa—but they failed to capture the summits of the hills that command the Narrows and the great Turkish forts.

The land forces had the constant support of British and French fleets, which engaged the defenses at close range.

On May 11 the British battleship *Goliath* was sunk, and two weeks later a German submarine made its way through the straits of Gibraltar, succeeded in torpedoing the British battleship *Triumph* and the *Majestic* and *Agamemnon*.

On January 9, 1916, the British and French forces entirely withdrew from the Gallipoli Peninsula, and the attempt to force the Dardanelles was abandoned.

Internal Communications.—The railways of Turkey have made great strides in recent years. Constantinople is now in direct communication with Salonica and Monastir by means of a coastal line. and with Sophia, Nisch, and Belgrade, by means of a line passing up the Maritza Valley, through Adrianople and Philipopolis, and thence over a pass between the Balkans and Rhodope Mountains. Salonica is further united with Uskub and Mitrevitza.

The postal and telegraphic services are a long way behind those of other European countries, and foreign nations still find it necessary to maintain their own post-offices in the large towns and ports.

Bagdad Railroad.—The most important step in the industrial progress of Turkey in modern times is the concession for the construction of the Bagdad Railroad, which, when completed, will connect the Mediterranean with the Persian Gulf.

By a provisional convention, preference was given to a German company in 1903. England had a particular interest in the proposed scheme, as the line suggested would provide a short route to India; accordingly, in 1903, the British government objected to the railway being placed under German control, and discussion followed with a view to putting the line under international control. By the agreement of 1903 it was decided the German group should control forty per cent of the capital, the French, through the Imperial Ottoman Bank, thirty per cent, the Austrian, Italian, Swiss, and Turkish twenty per cent, and the Anatolian Railway ten per cent. In 1904, one hundred and twenty-four miles of the line were completed, from Konieh, through Eregli, to Bugurlu. In 1908 sanction was given to extend the line eastwards from Bugurlu across the Taurus to Adana.

The total length of the line will be one thousand five hundred and fifty miles and will run through Aintab and Berejik to Mosul, thence along the right bank of the Tigris to Badgad.

THE CONTINENT OF NORTH AMERICA

Since the beginning of the sixteenth century America has been the general name for the two continents and adjacent islands, forming the main body of land found in the western hemisphere.

Position and Extent.—North America forms the northern section of the "New World" discovered by Columbus. It is separated from Europe by a sea nine hundred and thirty miles broad, from Asia by Bering Strait sixty miles across, and extends from the Arctic Ocean nearly to the equator.

The main mass is triangular in shape, and its outline varied by large peninsulas, broad gulfs and numerous inlets. Development of coast-line, twenty-eight thousand one hundred and thirty miles. Length, four thousand five hundred miles; breadth, three thousand one hundred miles. The area of the continental mainland is estimated at seven million one hundred and forty-six thousand six hundred and forty-one square miles; the entire area, including Greenland, the Arctic Archipelago, the West Indies, Newfoundland, and other islands, at over nine million square miles.

Islands.—It is customary to regard Greenland as a part of America, while the adjacent island of Iceland, though partially in the western hemisphere, is usually associated with Europe. The other principal American islands in the Atlantic are Newfoundland, Cape Breton, Anticosti, Prince Edward Island, Long Island, the Bermudas, the Antilles or West Indies, Joannes, Staten Island and South Georgia.

In the Pacific are the Aleutian Islands, Kadiak, the Alexander and Queen Charlotte groups, Vancouver and other British-Columbian Islands, the Santa Barbara group, Bevilla-Gigedo, the Pearl Islands, and others in the Gulf of Panama, the Galápagos, Juan Fernandez and the associated islets, Chiloe and the Chonos Archipelago. In the Arctic Ocean there are many large but unimportant islands. (See Map of Comparative Size of Islands and Table of Areas.)

Coast-line.—The coast-line of North America on the west is almost everywhere high and rocky. To the south of Puget Sound good harbors are rare, but British Columbia and Alaska have great numbers of good seaports, the coast-line being, in many places, deeply cut with high-walled fjords, or "canals," and elsewhere sheltered by ranges of high and well-wooded islands. The Atlantic coast, north of New York Bay, is generally rocky and well sheltered with islands, and has abundance of good natural harbors; but south of the parallel of New York the coast of the mainland is almost everywhere low and sandy. Many of the best ports are formed by river-mouths, and have sandbars across their entrances. Nowhere else in the world is there any such extent of low and sandy coast as on the Atlantic and Gulf seaboards of the United States.

Surface.—The western mountain-system of North America comprises a very great number of minor ranges, mostly having a north and south direction. The main chain (Sierra Madre) cannot be said to preserve an unmistakable identity throughout. The Coast Range, the Sierra Nevada, and the Cascade Mountains are the most noted of the western parallel ranges; they all lie on the Pacific slope, and contain some of the highest of North American peaks. The elevated plateau called the Great Basin (chiefly in Utah and Nevada), contains the Great Salt Lake and several smaller bodies of strongly saline water, evidently the remains of a much larger lake which once sent its waters to the sea. The eastern or great Appalachian mountain-system has a general direction nearly parallel with the Atlantic coast-line.

North of the St. Lawrence River is seen the vast and complicated Laurentian mountain-system, which extends from the Atlantic westward to near Lake Superior.

The highest summits are Mt. McKinley, in the north; Mt. Harvard, in the Rocky mountains; Mt. Whitney, in the Sierra Nevadas; and Mt. Popocatepetl or Peak of Orizaba, in Mexico. (See Tables of Mountain Peaks.)

Rivers and Lakes.—In the Rocky Mountain region of Canada, the great rivers, Yukon, Fraser, Columbia, Saskatchewan, and Mackenzie, take their rise. Between these mountains and Hudson Bay, a girdle of vast lakes, or inland seas (Great Bear, Great Slave, Athabasca,

Deer Lake, Winnipeg, and others), form a regular succession running from the Arctic Circle to Lake Superior, the first of a wonderful chain of great sea-like expansions of the Upper St. Lawrence (the others being Michigan, Huron, Erie and Ontario). North of the St. Lawrence system almost the whole country is thickly studded with lakes, which, with their connecting streams, form a network of important waterways traversable by canoes and boats.

The Atlantic slope of the United States is well supplied with water, and many of its streams afford extensive navigation. The Hudson is noted for its fine scenery; the Potomac is one of the noblest of American rivers; and important streams flowing to the Atlantic are the St. John, the Penobscot, the Kennebec, the Merrimac, the Connecticut, the Delaware, the Susquehanna, the James, and the St. John's, nearly all navigable in their lower courses.

The chief rivers flowing to the Gulf of Mexico are the Appalachicola, the Mobile, the Pearl, the great Mississippi, the Sabine, the Trinity, the Brazos, the Colorado of Texas and the Rio Grande.

Of the many large Alaskan rivers the principal are the Yukon and the Kuskoquim. The Fraser is a swift and strong river; the great river Columbia is noted alike for its navigation, its salmon fisheries, and its enormous cataracts. The Rio Colorado, whose waters flow to the Gulf of California, traverses a desert plateau. Here nearly every watercourse runs in a deep-walled cañon, a narrow valley with precipitous sides, often of prodigious height.

In the plateau of Central America the largest lake is that of Nicaragua, nearly equal to Ontario in extent, and only one hundred and thirty-one feet above the level of the sea. (See further under the respective countries of North America.)

Climate.—Largely determined by the direction of the mountain ranges. Five climatic regions, viz., an arctic region, whose mean temperature is less than thirty-two degrees Fahrenheit; an Atlantic temperate region, extending as far as the Mississippi, with abundant rains and dense woods; an inland temperate region, dry, with steppes or prairies; a Pacific coast region, and a tropical region.

Political Divisions.—The political divisions of North America are:

(1) Danish America,* which includes Greenland and three small islands of the Virgin group in the West Indies.

(2) British North America, in which division we may place the Dominion of Canada, Newfoundland, Labrador, the Bermudas, the numerous British West Indian islands, and British Honduras.

(3) The United States, including the detached territory of Alaska.

(4) Mexico.

(5) The Central American republics of Honduras, Guatemala, Salvador, Nicaragua, and Costa Rica, together with Panama—unless its southern part be regarded as belonging to the South American continent.

(6) The West Indian republics of Hayti and San Domingo.

(7) The Dutch West Indies.

(See the articles on the separate states and colonies.)

*The Danish West Indies were transferred to the sovereignty of the United States in 1917 at the purchase price of twenty-five million dollars.

THE UNITED STATES

The republic of the United States is by far the most populous, wealthy, and progressive country of all the New World.

Location and Extent.—It occupies the most valuable portion of the North American continent, the whole of it (with the exception of the territory of Alaska) lying within the temperate zone, between Canada on the north and Mexico on the south, and reaching across from the Atlantic to the Pacific Ocean.

Its boundary toward the Canadian Dominion passes through the Haro, or northern channel of the Strait of San Juan de Fuca, south of Vancouver Island, and thence along the forty-ninth parallel of latitude to Lake Superior; then midway through the center of the Great Lakes to the St. Lawrence, and down that river to the forty-fifth parallel, and an irregular boundary which separates New Brunswick from the States of New York and Maine, terminating at Passamaquoddy Bay.

In the south, the Mexican frontier runs from the Pacific coast, northward of the peninsula of California, to the Rio Grande del Norte, which it follows to the Gulf of Mexico.

From Atlantic to Pacific, the breadth of the United States is not less than twenty-five hundred miles; and from north to south the country extends nearly seventeen hundred miles.

Surface.—The surface of the United States from east to west may be divided as follows: (1) The Atlantic Plain, which extends from the coast to the Allegheny Mountains. (2)

The Mississippi Valley and Great Central Plain, which extends from the Allegheny Mountains west to the Rocky Mountains. (3) The Western Highlands. (4) The Pacific slope, which extends from the Rocky Mountains to the Pacific Ocean.

Mountains and Plains.—The chief mountain systems are the Appalachian region in the east and the Rocky Mountains in the west.

THE APPALACHIAN SYSTEM begins in the northern part of New England (in Maine without the appearance of regular ranges) and New York, and extends southwestward to Alabama and Georgia, being divided by the Hudson River valley and Lake Champlain, and that of the Mohawk River into three distinct sections.

A coast-plain extends from its eastern base to the Atlantic. It is narrow in Maine, where it terminates in a bold rocky coast indented by bays, and broken into projecting promontories and islands. South of Massachusetts the coast becomes lower and more sandy, and the plain grows gradually wider, with the exception of a narrow belt at New York, until in North Carolina it attains a width of two hundred miles.

In the southern part of New England it is characterized by hills, and below New York by a distinct coast region and a more elevated slope. This higher region, which is in Virginia and thence southward, is marked by a somewhat abrupt terrace, varies in altitude from a few hundred to more than a thousand feet, and is known as the Piedmont plateau. The lower coast region is seldom more than one hundred feet above the sea. It has a sandy soil, and in many places there are large swamps near the coast. Much of this swampy country is uninhabitable, but when reclaimed, as it has been in many parts of North and South Carolina, it makes valuable rice-land. Many acres of fertile agricultural land have also been secured in Florida by draining its swamps. The middle elevated region is diversified by hills and valleys, and has a productive soil. The dividing line between it and the low coast-plain marks the head of navigation of most of the streams, and also determines the sites of many important towns.

The surface of this region today is a series of parallel ranges divided by fertile valleys. The various ridges are named as follows: The Blue Ridge, which lies nearest the Atlantic; the Kittatinny Chain; the Allegheny Mountains, which lie in the western part of Virginia and the central part of Pennsylvania; the Cumberland Mountains, on the eastern boundary of Tennessee and Kentucky; the Catskill Mountains, in the State of New York, which are continued in the Sacondago Chain; the Green Mountains, in the State of Vermont; the Hudson River Highlands, and the hills of New Hampshire. There is no peak of marked elevation in the Appalachian region, the highest point being Mt. Washington, in New Hampshire, which reaches a height of nearly seven thousand feet.

GREAT CENTRAL PLAIN.—West of the Appalachian system and lying between it and the western highland is a great central valley, forming part of the continental depression which extends from the Arctic Ocean to the Gulf of Mexico. It is almost an absolute plain, rising gradually from the Gulf toward the chain of Great Lakes in the north, and toward the mountains on the east and west. The only important departure from its uniform level character is an elevation of from five hundred to two thousand feet, running from southern Missouri through northwestern Arkansas into eastern Oklahoma, and known as the Ozark Mountains.

This great valley occupies about one-half the entire area of the United States, and the fertile prairies and bottom-lands of the eastern and central portions make it the most important agricultural basin of the globe. From an irregular line west of the Mississippi River the land rises in an almost imperceptible slope till it reaches the base of the western plateau.

THE ROCKY MOUNTAIN SYSTEM extends a distance of about two thousand miles. The system is continued in Canada. The Rocky Mountains are not a single range, but are double and sometimes threefold. These ranges are the edge of a region of plateaus and hills which extends to the coastal mountains. The chief mountain ranges belonging to the United States Rockies are the Bitter Root Mountains, the Blue Mountains, and the Big Horn Mountains in the north; the Wahsatch Mountains, the Wind River Mountains, and the White Mountains in the center; and the Sierra Madre and the Sangra de Cristo Range in the south. In the western part of the southern Rockies lies the Great Basin of Colorado, with the Wahsatch Mountains on the east and the Sierra Nevada on the west. This basin is extremely arid, has suffered much volcanic action.

THE WESTERN OR PACIFIC SYSTEM forms a part of the vast elevation which extends from the northern to the southern extremity of the western continent. In the United States it is a great plateau of four thousand to ten thousand feet surmounted by a complex system of ranges, in its widest part more than one thousand miles broad. Of this Cordilleran region the Rocky Mountains form the eastern and the Sierra Nevada and Cascade Mountains and the Coast Ranges the western border.

In the ranges of central Colorado alone nearly forty of the summits have an altitude of more than fourteen thousand feet. In the Wind River Mountains, in Wyoming, are the head-waters of the Colorado, the Columbia, and the Mississippi, the three great river-systems of the United States; and in the northwestern corner of the same state is situated the National Park, famous for its hot springs and geysers as well as for its magnificent scenery (see Yellowstone).

Between the Wahsatch Range and the lofty masses of mountains in Colorado is a region of peculiar interest, consisting of level plateaus in which the changes of elevation from one plain to another are marked by abrupt descents and steep cliffs. It is furrowed by cañons or gorges, whose sides are nearly vertical; and the bed of the Colorado is in some places more than a mile and a quarter below the surface of the plateau. (See Grand Cañon under Colorado River.)

Between the Wahsatch Range and the Sierra Nevada lies the Great Basin, an immense tract having at best but little rainfall, except upon the summits of the ranges by which it is traversed, and none of whose waters are drained to either ocean. The saline swamps, salt lakes, and sinks of Nevada indicate the former location of one of these lakes; Great Salt Lake is all that now remains of the other.

The Sierra Nevada and the Cascade Range are topographically continuous, and constitute a great mountain-wall, which so far as the height of the peaks and the grandeur of the scenery are concerned, is one of the most striking portions of the Cordilleran system. Most of the peaks of the Sierras are, however, of granite and metamorphic rock, while those of the Cascade Range are volcanic. The greatest altitude is attained with Mt. Whitney as the culminating point. The lofty character of the range is maintained throughout the greater part of California, and the sublimity of the scenery is justly celebrated. (See Yosemite Valley.)

From this point there extends northward one of the most remarkable groups of extinct or faintly active volcanoes to be found anywhere in the world: the lava overflows in this region cover an area of above two hundred thousand square miles. The most prominent peaks are Mt. Shasta, in California, and Mt. Rainier, in Washington. In three separate places rivers have cut a passage through the volcanic portion of the range. The most notable is the passage of the Columbia River in a grand cañon more than three thousand feet in depth.

The Coast Ranges of Washington, Oregon, and northern California consist of numerous and approximately parallel chains, which as a rule pitch off abruptly toward the sea, leaving no coast-plain. Between the Coast Ranges and the Sierra Nevada and Cascade Range is a series of broad valleys, occupied mainly in Oregon by the Willamette River, and in California by the Sacramento and San Joaquin. In southern California the mountains of the Coast Ranges diminish in height, but throughout their whole extent they are interspersed with picturesque and fertile valleys.

Coast.—The Atlantic coast has a length of about twelve thousand three hundred and sixty miles; the Gulf Coast of five thousand seven hundred and fifty miles, and the Pacific Coast of three thousand two hundred and fifty miles.

On the coast of the New England states there are many indentations which, though small, furnish commodious harbors. Long Island Sound adds greatly to the commercial importance of New York harbor, and farther south are Delaware and Chesapeake Bays, Albemarle and Pamlico sounds, and several small indentations, such as those which form the harbors of Charleston and Savannah. The Chesapeake Bay is the largest indentation of the Atlantic Coast and runs inland in a northward direction for more than one hundred and eighty miles, with an average breadth of about fifteen miles. From Cape Hatteras to Cape Sable, however, the coast is swampy, and, especially in Florida, fringed with lagoons. The harbors of this part of the coast are not good naturally. The coast of the Gulf of Mexico is low and very swampy, but is of special climatic and commercial importance.

The Pacific Coast of the United States has a very narrow Continental Shelf, and few bays or capes. With the exception of Puget Sound, the Bay of San Francisco, and the harbor of San Diego, there is scarcely a noticeable break in the continuity of the coast line.

Islands.—There are many small rocky islands along the coast of Maine, and on the southern New England Coast is a group to which belongs Long Island, the largest of the islands of the United States. Farther south, off the Atlantic Coast, and also in portions of the Gulf of Mexico, are many low sand-spits lying parallel to the coast and having behind them shallow channels, lagoons and swamps. On the Pacific Coast there are no islands of importance except the Santa Barbara group off the southern coast of California.

Rivers.—The rivers of the Atlantic Plain rise in the Appalachian system, and are comparatively short. In many cases they are too rapid to be of much value for navigation, but are valuable for supplying water power. These rivers almost without exception have good harbors at their mouths. The chief are: the Hudson, the Delaware, the Susquehanna, the Potomac, the James, and the Savannah.

The Great Central Plain is drained by the Mississippi-Missouri river system, the basin of which covers half the area of the United States, and is equal in area to about one-third the area of Europe.

The Mississippi rises in Lake Itasca, in Minnesota, at about fifteen hundred feet above sea-level. After flowing for about one hundred miles in an easterly direction it turns south, and is joined by numerous tributaries. The chief are: St. Peter's River, which joins the main stream nine miles above St. Anthony's Falls; the Missouri, which enters the Mississippi just above St. Louis; the Ohio, which joins the main river at Cairo; the Arkansas, the Wisconsin, the Illinois, and the Red River.

The Mississippi-Missouri has made a broad flood plain, varying in width from thirty to sixty miles. This plain is subject to severe inundations, for it slopes very gently away from the river bed, which is in many parts of the river above the level of the surrounding plain. The river carries a vast amount of silt, which it deposits at its mouth, thus forming a delta which stretches a series of long, narrow, tentacle-like arms seaward.

Other rivers falling into the Gulf of Mexico are the Mobile and the Rio Grande. The Mobile, which enters the gulf at the town of Mobile, is the union of the Alabama and the Tombigbee. The Rio Grande forms the boundary between Texas and Mexico.

The rivers flowing into the Pacific are comparatively short, owing to the nearness of the coast ranges to the sea. The Colorado River flows into the Gulf of California, after crossing an arid plateau. (See description below.)

The San Joaquin and the Sacramento rivers unite and flow into the harbor of San Francisco; these and the Columbia are the only important rivers entering the Pacific.

The Great Basin of California is largely an area of inland drainage. The rivers flow into lakes with no outlets to the sea.

Colorado River (Spanish for "red" or "reddish"), is a remarkable river formed by the union of the Grand and Green Rivers, and flowing through the great plateau region. Below the junction of the Green and Grand, the main affluent in Utah is the San Juan, which drains an interesting region in the southwest of Colorado and the northwest of New Mexico. In Arizona the main affluents are the Colorado Chiquito or Flax River, the Bill Williams, and the Rio Gila, all from the left. The only important affluent the Colorado receives from the right is the Rio Virgen. From the junction of the Grand and Green the general course of the stream is to the southwest through the southern part of Utah and northwestern Arizona; and it afterwards separates Arizona from Nevada and California. The lower part of its course is in Mexican territory, where it flows into the northern extremity of the Gulf of California.

The most striking features of the Colorado basin are its dryness, and the deeply channeled surface of the greater part of the country. Almost every stream and watercourse, and most of all the Colorado itself, has cut its way through stratum after stratum of rock, until now it flows in a great part of its course, at the bottom of a deep trench or cañon.

THE GRAND CAÑON.—The main stream, for nearly four hundred miles below the mouth of the Colorado Chiquito, thus makes its way through a great plateau, forming what is called the Grand Cañon of the Colorado, the most extensive and marvelous example of the kind anywhere known.

Throughout the upper part of the great cañon the walls are from four thousand to seven thousand feet in height, and are often nearly perpendicular. Frequently they are terraced and carved into a myriad of pinnacles and towers, tinted with various brilliant colors. At some points the walls on either side rise sheer from the water; at others there is a talus of fallen rock, or occasionally a strip of fertile soil, on one or both banks. There are two main trails by which the bottom of the cañon may be reached. The Bright Angel Trail is seven miles down from the rim to the river and requires three hours for the descent. The Grand View Trail is somewhat longer and more difficult.

This over-drained river basin has an area of two hundred and twenty-five thousand square miles. The whole course of the river below the junction is about nine hundred miles; to its remotest sources it is over two thousand miles. Navigation is possible for light-draft steamers for over six hundred miles. The river is subject to vast and frequent changes of volume, and except where confined by cañon-walls, the river channel shifts to and fro in a very remarkable degree.

Hudson River, one of the most beautiful and important in America, rises in the Adirondack Mountains, four thousand three hundred and twenty-six feet above the level of the sea, where its head-streams are the outlets of many mountain-lakes. At Glens Falls it has a fall of fifty feet, and soon after, taking a southerly course, runs nearly in a straight line to its mouth, at New York City. It is tidal up to Troy, one hundred and fifty-one miles from its mouth, and magnificent steamboats ply daily between New York and Albany.

Below Newburg, sixty miles from New York, the river enters the highlands, which rise abruptly from the water to the height of sixteen hundred feet. Here historical associations add to the interest of varied scenery of singular beauty and grandeur: here was the scene of Arnold's treason and of André's fate; and at West Point, the seat of the United States military academy, eight miles below Newburg, are the ruins of Fort Putnam, built during the War of Independence.

Emerging from the highlands the river widens into a broad expanse called Tappan Bay, which is four and one-half miles wide and thirteen miles long. Below, on the right bank, a steep wall of trap rock, called the Palisades, rises from the river's brink to a height of three hundred to five hundred and ten feet, and extends for nearly twenty miles to the upper portion of the city of New York.

The river from here is known as the North River, and is from one to two miles wide; and after passing between New York and Hoboken and Jersey City, it falls into New York Bay. Its whole length is about three hundred and fifty miles, and its principal tributaries are the Sacondaga, Mohawk, and Walkill.

The Hudson has valuable shad and sturgeon fisheries, and has large commercial value. It is connected by the Erie Canal with Buffalo and the Great Lakes, while the Richelieu Canal connects it with Montreal. The Hudson River Railroad, connecting New York with Albany, runs along the east bank.

The river is named for the English navigator who explored it in 1609. Robert Fulton's first successful experiment in steamboat navigation was made on this river in 1807.

The St. Lawrence, issuing from Lake Ontario, flows northeast for some seven hundred and fifty miles—part of the way forming the boundary between Canada and the United States—and falls into the Gulf of St. Lawrence by a broad estuary. But in its widest acceptation the name includes the whole system of the Great Lakes and their connecting streams, with a total length from source to mouth of two thousand miles, and a drainage basin of five hundred and sixty-five thousand two hundred square miles. It pours more fresh water into the ocean than any other river except the Amazon.

This mighty artery rises, under the name of the St. Louis, on the spacious plateau which sends forth also the Mississippi toward the Gulf of Mexico, and the Red River of the North toward Hudson Bay. Lake Superior (six hundred and two feet above sea-level), the next link in the chain, finds its way to Lake Huron through St. Mary's River, whose rapids have a fall of twenty and one-half feet. Below Lake Huron, which receives Lake Michigan from the south, St. Clair River, Lake St. Clair, Detroit River, and Lake Erie, maintain pretty nearly the same level (there is a fall of some eight feet, however, in Detroit River) till the river Niagara descends three hundred and twenty-six feet to Lake Ontario, which is itself still two hundred and forty-seven feet above the sea-level.

The St. Lawrence proper, with a number of lakelike expansions (such as the Lake of the Thousand Isles, of St. Francis, St. Peter, etc.), presents the character first of a river, and then of an estuary, down to the gulf. What is known as the Lake of the Thousand Islands contains about seventeen hundred islands, big and little, many of them extremely picturesque. This is a famous tourist region, with numerous hotels and other resorts as well as many fine private estates.

Prior to 1858 only vessels drawing not more than eleven feet of water could pass up the river above Quebec, but since then a channel has been made in the shallow parts of the river, three hundred feet wide and twenty-seven and one-quarter deep, which permits the passage up to Montreal of large vessels.

Between Lake Ontario and Montreal there are several rapids, which, however, may be all avoided by means of canals that have been constructed at a very great expense. Immediately above the

island of Montreal, the St. Lawrence is joined by its principal auxiliary, the Ottawa, from the northwest; and a little more than half-way between this confluence and Three Rivers, the highest point of tidal influence, the Richelieu from the south brings in the tribute of Lake Champlain. Other principal tributaries are the St. Maurice, the Saguenay, and the Batiscan. The width of the St. Lawrence varies from less than one to four miles; the estuary at its mouth is above one hundred miles across. During winter the river is frozen over and navigation closed.

Lakes.—Of the Great Lakes of North America, Lake Michigan lies within the United States, and the southern shores of Lake Ontario, Lake Erie, Lake Huron, and Lake Superior are United States territory. These lakes were formed by the action of the glacier which once covered the continent as far south as the forty-second parallel, roughly speaking. They are remainders of much larger lakes and are of the utmost importance as waterways.

New England has very many smaller lakes, which are also the result of glacial action. The largest lake of the United States apart from the Great Lakes is the Great Salt Lake of Utah. The extremely low rainfall of this region and the intense evaporation consequent upon the high temperature are responsible for the salinity of the waters of the lake.

The Great Lakes.—The five Great Lakes cover a total area of over ninety thousand square miles, forming the largest collective mass of fresh water in the world.

Lake Superior.—The northern shores of Superior are mostly precipitous cliffs ranging from three hundred to one thousand feet in height. On the southeast sandy coasts prevail. The coast on the south and southwest is composed largely of sandstone cliffs, rich in iron and other metal deposits. The bed of Superior is supposed to be an ancient volcanic crater. Its depth of one thousand and eight feet represents a depression extending four hundred feet below sea-level. Superior is, therefore, distinct in origin from the other lakes of the group, whose beds represent ancient river systems and date from the glacial period. The basin of the lake, closely circumscribed by the Mississippi and Hudson Bay watersheds, receives many streams, but all of them short.

Lake Huron, the second of the Great Lakes, is bounded north, east and south by the Province of Ontario, and south and west by the State of Michigan, including Georgian Bay (five thousand six hundred and twenty-six square miles), and North Passage, one thousand five hundred and fifty-six square miles. It is connected with Lake Michigan by the Straits of Mackinac, three and one-half miles broad and one hundred and thirty-five feet deep.

The discharge of Lake Huron is about two hundred and seventeen thousand cubic feet per second. By reason of evaporation and rainfall, the level of the lake varies annually between four and five feet, but much greater local variation is caused by the strong winds. The densely wooded northeast is broken by many low islands of limestone and glacial débris. Elsewhere the shores are almost unbroken and low, except when cliffs of one hundred or one hundred and fifty feet high rise from the northeast border and afford good sites for the many Canadian towns and villages. Nearly all the harbors on this coast are protected by breakwaters.

Lake Michigan.—The area of Lake Michigan includes Green Bay on the northwestern shore, and Grand Travers Bay directly on the eastern shore. Many islands lie in the lake between these two breaks in the shore, which elsewhere is low and unbroken.

About the southern and eastern borders are immense heaps of sand which have been piled up by waves and currents, and drift inland by the winds, sometimes, as at Sleeping Bear bluffs, completely burying the heavy forests.

The level of Michigan varies, but not as greatly as does that of Huron, according to the direction and force of the winds, the changes in rainfall, evaporation, atmospheric pressure, etc. Except when caused by protracted gales blowing steadily in one direction, this variation rarely exceeds one and three-tenths feet. The lake has a lunar tide with accompanying variation of from one and one-half inches neap to about three inches spring tide, and the water is warmer than the air in winter and cooler in summer, and visibly ameliorates the climate of the shores, as may be shown in the quantity and rich quality of the Michigan fruits. Like all the Great Lakes, Michigan abounds in fish, such as whitefish and trout.

Lake Erie has a northeast and southwest direction, bounded on the entire upper shore by the Province of Ontario, and on the southern and eastern shores by Ohio, Pennsylvania and New York. At its southwestern end it is connected with Lake St. Clair by the Detroit River. At its northwestern end it discharges into Lake Ontario through the Niagara River. It is connected by the Welland Canal with Lake Ontario and by other canals with the Hudson and Ohio Rivers, making it thus a link in the waterway from east to west.

Besides the drainage from the Lake Superior system, Lake Erie receives the Grand River, the Maumee from the west, and the Sandusky and Cuyahoga from the south. The west coast is broken by the islands of Put-in-Bay.

Lake Ontario is the most eastern, with a northeast and southwest direction, like Lake Erie. It is the lowest of the Great Lakes, and has naturally the largest discharge, three hundred thousand cubic feet per second. The shores are flat, except in the Bay of Quinte, which extends on the northeast fifty miles inland. There are many harbors and flourishing ports. The waters have a surface current, due to the fact that the larger axis of the lake coincides with the direction of the prevailing westerly winds. This, added to frequent violent storms, keeps the lake from freezing, except a few miles in width along the shores.

Lake Ontario is connected with the Erie Canal and Hudson River by the Oswego Canal and with the Ottawa River by the Rideau Canal.

Great Salt Lake, in Utah, stretches along the western base of the Wahsatch Mountains, about four thousand two hundred feet above the sea, forming a principal drainage center of the Great Basin. Well-marked shore-lines on the mountains around, reaching one thousand feet higher than the present level, show that the lake had formerly a vastly greater extent; this prehistoric sea has been named Lake Bonneville. Great Salt Lake is over eighty miles long and from twenty to thirty-two broad, but for the most part exceedingly shallow. It contains several islands, the largest Antelope I., about eighteen miles long. Its tributaries are the Bear, Ogden, Jordan and Weber, the Jordan bringing the fresh waters of Lake Utah; but Great Salt Lake has no outlet save evaporation, and its clear water consequently holds at all times a considerable quantity of saline matter in solution. Several species of insects and a brine-shrimp have been found in its waters, but no fishes; large flocks of water-fowls frequent the shores.

The first mention of Great Salt Lake was by the Franciscan friar Escalante in 1776, but it was first explored and described in 1843 by Fremont.

Champlain is a beautiful lake separating the states of New York and Vermont, and penetrating, at its north end, about six miles into the Dominion of Canada. Lying ninety-one feet above sea-level, it is one hundred and ten miles long, by from one to fifteen broad, empties itself into the St. Lawrence by the Richelieu River, and has communication by canal with the Hudson. The lake, now an important trade channel, was the scene of several incidents of the French and Indian revolutionary wars; and here a British flotilla was defeated by the Americans September 11, 1814. It was discovered by Champlain in 1609, and in 1909 tercentenary celebrations of its discovery were held along its shores.

Natural Wonders.—Of the great natural wonders the chief are the Niagara Falls, the Grand Cañon of Colorado, and Yellowstone Park. The Sequoia, General Grant and Calaveras Parks—all reservations of the famous big trees, many thousands of years old, have also great scenic interest. Mt. Ranier Park, in Washington, encloses the noblest and most interesting mountain of our Pacific Coast. The chief feature of Crater Lake Park, in southern Oregon, is a lake two thousand feet deep, occupying the crater of an extinct volcano on the summit of the Cascade Range, with walls one thousand to two thousand feet high. The latest addition is Glacier Park, in northwestern Montana. It is named from its glaciers, of which there are over sixty within an area of five square miles, and contains numerous snow-capped peaks seven thousand to twelve thousand feet high. It also contains Lake McDonald, one of the most beautiful alpine lakes. Among the national monuments are the petrified forests in Arizona.

Garden of the Gods, a region in Colorado, is noted for its view of Pike's Peak, and its weird and grotesque rock pinnacles, needles, etc., some of which receive descriptive names such as Cathedral Spires. The region is about five hundred acres in extent, and in 1908 was presented to Colorado Springs city.

Grand Canyon.—See under Colorado River.

Mammoth Cave, in Kentucky, is eighty-five miles by railroad southwest of Louisville. The cave is about ten miles long; but it is said to require upwards of one hundred and fifty miles of traveling to explore its multitudinous avenues, chambers, grottoes, rivers and cataracts. It is the largest cavern in the world. The main cave is only four miles long, but it is from forty to three hundred feet wide, and rises in height to one hundred and twenty-five feet. Lucy's Dome is three hundred feet high, the loftiest of the many vertical shafts that pierce through all the levels.

It is estimated that there are more than four thousand sink-holes and five hundred open caverns. Some avenues are covered with a continuous incrustation of the most beautiful crystals; stalactites and stalagmites abound.

There are several lakes or rivers connected with Green River outside the cave, rising with the river, but subsiding more slowly, so that they are generally impassible for more than six months in the year. The largest is Echo River, three-fourths of a mile long, and in some places two hundred feet wide. The air of the cave is pure; the temperature keeps at about fifty-four degrees.

Among the most striking facts which exploration has revealed are the following: there is a pit, named the Bottomless Pit, one hundred and five feet deep, besides Scylla, one hundred and thirty-five feet deep. Crevice Pit, with Klett's Dome, which forms a part of it, is one hundred and fifty feet in total vertical measurement. Cleveland

GARDEN OF THE GODS, COLORADO,

is a tract of land about five hundred acres in extent, thickly strewn with grotesque rocks and cliffs of red and white sandstone. Among the chief features are the Cathedral Spires, the Balanced Rock, etc. The Gateway of the Garden of the Gods consists of two enormous masses of bright red rock, three hundred and thirty feet high and separated just enough for the roadway to pass between.

BIG TREE, CALIFORNIA

The Mariposa Grove of Big Trees (six thousand five hundred feet), so-called from its situation in Mariposa ("butterfly") County, occupies a tract of land four square miles in area, reserved as a State Park, and consists of two distinct groves, one-half mile apart. The Lower Grove contains about two hundred and forty fine specimens of the Sequoia Gigantea, including the "Grizzly Giant," the largest of all, with a circumference of ninety-four feet and a diameter of thirty-one feet. Its main limb, two hundred feet from the ground, is six and one-half feet in diameter. In ascending to the Upper Grove, which contains three hundred and sixty big trees, the road goes through a tunnel, ten feet high and nine and one-half feet wide (at the bottom), cut directly through the heart of a living Sequoia, twenty-seven feet in diameter. (See illustration.) About ten of the trees exceed two hundred and fifty feet in height and about twenty trees have a circumference of over sixty feet, three of these being over ninety feet. The Calaveras Grove has taller trees than any in the Mariposa Grove, but the latter has those of greatest circumference. At Santa Cruz there is a grove which contains about a score of the genuine Redwood with a diameter of ten feet and upwards. The largest is twenty-three feet across; one of the finest, named the Giant, has a circumference of seventy feet. Here is a large hollow tree in which General Fremont camped for several days in 1847. Another stump is covered with a platform, which holds twelve to fourteen people.

Avenue is two miles long, Silliman's one and one-half miles and in places two hundred feet in width. Large stretches of water have been christened Dead Sea, Lake Lethe; also there are the Styx, and Roaring and Echo rivers. In the outer galleries of the cave millions of bats are congregated. There are also blind fish, crayfish, crickets, and other abnormal insect inhabitants of the cave.

Niagara Falls.—See under Famous Waterfalls.

Yosemite Valley is the name of a cleft in the west slope of the Sierra Nevada, about the center of California, and one hundred and forty miles east of San Francisco. The name Yosemite is an Indian word which signifies "large grizzly bear." This celebrated valley, noted for the sublimity and beauty of its scenery, is about six miles long and from one-half to nearly two miles in breadth, and is traversed by the Merced River. The beholder is awed and impressed by the massiveness of its mountain elevations, the nearly perpendicular granite walls, from three thousand to six thousand feet high, by which it is shut in throughout its entire length, and the grandeur of its waterfalls, which are in some respects the most remarkable in the world.

At the lower end of the valley stands the striking cliff known as El Capitan, three thousand three hundred feet high, while from near its lower corner the Virgin's Tears Fall descends one thousand feet. But the eye turns from it to the remarkable fall opposite, happily named the Bridal Veil, which leaps from the brow of a cliff nine hundred feet high, and descends in a broad sheet of spray and finally mist, swaying in the wind and constantly changing its form of fleecy beauty. Farther up the valley are Cathedral Rock (two thousand six hundred and sixty feet), the Three Brothers (three thousand eight hundred and thirty feet), Sentinel Rock (three thousand and forty-three feet), and directly opposite it the grand Yosemite Falls. (See Famous Waterfalls.) Above the falls are the North Dome (three thousand five hundred and sixty-eight feet) and the vast Half Dome, nearly one mile (four thousand seven hundred and thirty-seven feet) high, whose summit can now be reached by a long climb. Two miles above the great falls the stream enters the main valley in two arms, coming out of two canyons. In that of the south fork is the Illilouet Fall, some six hundred feet high; in the main canyon are Vernal Fall and Nevada Fall, the latter one of the finest in the world.

(See Famous Waterfalls.)

The country surrounding the valley and constituting the National Park is a rolling and hilly region varying from eight thousand to ten thousand feet above sea-level. There is little soil or vegetation except a scattered forest growth. Small glaciers still remain near the summits of some of the adjacent mountains. Bare granite peaks rise still higher from this surface.

Yellowstone National Park comprises a tract of land originally comprising three thousand five hundred and seventy-five square miles in northwestern Wyoming, set apart by act of Congress in 1872 as a national park to preserve from destructive molestation the most wonderful group of natural features and phenomena known within the boundaries of the United States. It is readily reached over the Northern Pacific Railroad, which has a branch from Livingston to Gardiner, just outside the north park boundary, thirty-six hours' ride from St. Paul; or it may be reached from the Oregon Short Line R. R. from the west side by a more difficult stage connection.

The whole park plateau lies between six thousand and eight thousand feet above sea-level. The mountains rise in great grandeur upon this plateau, giving evidence of their volcanic origin, though now extinct, by their form, and their rock structure, and the many evidences of pent-up heat that one sees in the hot springs and geysers for which the locality is justly famous. Twenty-four peaks rise over ten thousand feet, several over eleven thousand. Electric Peak on the border is eleven thousand one hundred and fifty-five feet. Many have been glaciated. Just outside the Teton Range peaks rise to nearly fourteen thousand feet. It is a part of the continental divide and from Two-ocean Pond the waters may flow into either the Atlantic or the Pacific. The Yellowstone, Snake and Madison rivers are fed by the waters from this area.

The surface of the park is dotted with lakes, the largest being Yellowstone Lake, standing seven thousand seven hundred and forty-one feet above sea-level, ten by twenty miles in average dimensions, the largest body at so great elevation in the United States.

The streams contain numerous falls and rapids, twenty-five of special interest, some as picturesque as the Falls of the Yellowstone, though not on such a grand scale, and some far removed from the usual routes of travel. The falls and canyons of the Yellowstone are considered among the most wonderful in the world. The canyon is cut more than two thousand feet deep into the lavas and sediments, exhibiting the most fantastic carvings of erosion, modified by an exquisite blending of colors. Into it plunges the river by two great leaps, the Upper and the Lower Falls, one hundred and twelve and three hundred and ten feet high respectively, and then flows on as a narrow ribbon scarcely more than one hundred and sixty to two hundred feet wide for twelve miles of this wonderfully beautiful chasm.

Yellowstone Park includes within its borders the largest geysers in the world. There are about seventy in all, included in six groups or geyser basins. Norris, Upper, Middle and Lower basins, ten to fifteen miles apart, are on the headwaters of the Madison, here called Five Hole River. The Upper is most active and is called the Great Geyser Basin. A group is also found at Shoshone Lake, at the head of Snake River, and another group at Heart Lake. Fifty geysers spout water and steam from thirty to two hundred and fifty feet into the air. Some spout from open bowl-shaped basins, and others have built cones or tubes by their deposits. Extinct geysers are marked by the remains of these cones, among which is Liberty Cap. Excelsior geyser is the largest of all. It has a bowl-shaped opening two hundred by three hundred feet, flows four thousand gallons of boiling hot water per minute, and throws a fifty-foot column of water and steam seventy-five feet to two hundred and fifty feet high. Giant throws a five-foot column over two hundred feet high for an hour. Old Faithful, so named because of its exceptional regularity, every sixty-four to sixty-five minutes without a failure within the memory of the oldest observers, discharges a column one hundred and fifty feet high amounting to one and a half million gallons of water at each eruption. There is every gradation in size and violence and periodicity.

In the Mammoth Hot Springs area, near the northern boundary, where there are fifty active springs within an area of one hundred and seventy acres, there is a travertine accumulation of one thousand feet. Others deposit silica in similar manner, both types aided much by algous plant growth in the mineralized warm waters. In some places sulphur has been deposited.

Nine-tenths of the whole area is forest. The tree limit varies from nine thousand four hundred to nine thousand seven hundred feet. Few of the plateau localities are bare. Pine, poplar, balsam, cedar and spruce grow abundantly and many to large size. In the spring and geyser localities the trees are often covered by deposits and buried. Whole forests have been thus entombed. Petrified trees are common. Wild animals are wholly unmolested. Deer, elk, buffalo and bear may be seen and approached near enough to photograph. Trout abound in the waters throughout.

The first white man to attempt an exploration

NATURAL BRIDGE OF VIRGINIA

The Natural Bridge of Virginia (one thousand five hundred feet above the sea) is a huge monolithic limestone arch, two hundred and fifteen feet high, one hundred feet wide, and ninety feet in span, crossing the ravine of the Cedar Creek. It seems to be a remnant of a great horizontal bed of limestone rock that entirely covered the gorge of the brook, which originally flowed through a subterranean tunnel. The rest of this roof has fallen in and been gradually washed or worn away. The bridge is finely situated in a beautiful amphitheater, surrounded by mountains, on land originally granted by George III. to Thomas Jefferson, who built a cabin here for the use of visitors. Among the names upon the smooth side of the archway is that of George Washington (west side, about twenty-five feet up), which was the highest of all until a student named Piper actually climbed from the bottom to the top of the arch in 1818.

of the region was a trapper named Coulter, who in 1805 traversed a part of this district. His tales were disbelieved, but were confirmed thirty years later by the discoveries of Bridger. In 1870 the first official survey was made, and in 1871 Hayden's famous expedition revealed the glories of the Yellowstone district.

Climate and Irrigation.—The United States, stretching over such a vast area and having such great tracts of mountain and plain, must necessarily present a great variety of climate. The mean annual temperature ranges from under forty degrees to seventy-five degrees. The isotherm of fifty-five degrees mean annual temperature crosses the center of the country from east to west, passing through St. Louis. The mean annual rainfall for the whole country is about thirty inches, but there is a great difference in this respect between different parts. The rainfall is most abundant on the northwest Pacific Coast, on the Gulf Coast, and on the higher mountain ranges. On the great plains it is only ten to twenty inches, and there are large desert stretches in the Rocky Mountain region with a rainfall of less than ten inches.

Irrigation.—As far as lack of rainfall is concerned in the so-called rainless regions of the United States, this has been notably offset by great works of irrigation that have been steadily going forward. Agriculture, horticulture and vitaculture are, therefore, no longer dependent on chance but science, as the National Irrigation Congress expresses it.

Modern irrigation in the United States began in 1750 with the watering of the gardens in the hills and deserts of the coast of California by the adventurous missionaries from Mexico. Irrigation by English-speaking people had its origin in Utah one hundred years later. There the Mormons, separated by one thousand miles of untrodden desert from all cultivated land, found in irrigation their only means of escape from starvation.

In 1870 there were twenty thousand acres under irrigation, followed by a rapid development of small ditches, until in 1880 there were one million acres irrigated. Today (1917) upward of fifty million acres are included in reclamation projects, and it is estimated that there are upward of four hundred and fifty million acres still awaiting the scientific use of water.

The diversity of methods used in irrigation in the United States is remarkable. Practically every system to be found in the world can be seen in some part of the arid west. This is due to the fact that many of the irrigators have come from distant parts of the world and each seeks to introduce on his farm customs and practices of his old environments. This is particularly noticeable in California, where the Chinese irrigate their truck gardens in Chinese fashion, and Italians, Spaniards and Mexicans imitate for a time at least the practices of their forefathers.

Upward of one hundred and fifty thousand miles of irrigation canals, with reservoirs and supplementary works, have been built at a cost of more than six hundred million dollars. These projects are distributed through the States of Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington and Wyoming. The most notable among them are: the Truckee-Carson Canal and Reservoir, in Nevada; the Minidoka project, in southern Idaho; that of the Uncompahgre Valley, in Colorado; the Roosevelt Dam, in the Salt River Valley, Arizona; the Klamath Reservoir, on the Oregon-California boundary; the Boisé project, Idaho; that of Yuma, on the Arizona-California boundary; North Platte, on the Nebraska-Wyoming boundary; and the gigantic Elephant Butte Reservoir, in New Mexico—the second largest in the world.

Political Divisions.—Under its present organization the United States comprises fifty-one political divisions. Of these forty-eight are states enjoying the full privileges afforded by the federal constitution. The three territories —Alaska, Hawaii and Porto Rico—all are organized but not yet admitted to statehood. The Philippines have a modified territorial government.

(See Tables appended.)

It is worthy of remark that the center of population advanced westward during the ten decades since 1790 in a nearly uniform line along the thirty-ninth parallel of latitude.

THE CENTER OF POPULATION

Census Year	Approximate Location by Important Towns	From Point to Point in Direct Line†
1790	Twenty-three miles east of Baltimore, Md.	.....
1800	Eighteen miles west of Baltimore, Md.	40.6
1810	Forty miles northwest by west of Washington, D. C.	36.9
1820	Sixteen miles north of Woodstock, Va.	50.5
1830	Nineteen miles west by southwest of Moorefield, W. Va.*	40.4
1840	Sixteen miles south of Clarksburg, W. Va.*	55.0
1850	Twenty-three miles southeast of Parkersburg, W. Va.*	54.8
1860	Twenty miles south of Chillicothe, Ohio	80.6
1870	Forty-eight miles east by north of Cincinnati, Ohio	44.1
1880	Eight miles west by south of Cincinnati, Ohio	58.1
1890	Twenty miles east of Columbus, Ind.	48.6
1900	Six miles southeast of Columbus, Ind.	14.6
1910	In the city of Bloomington, Ind.	39.0
1920	In Owen county, Ind., 8.3 miles southeast of Spencer, Ind.	

*West Virginia formed part of Virginia until 1860.
†Movement in mines during preceding decade.

Public Lands.—The United States originally owned nearly all the area of the states, with the exception of the original thirteen. Homesteads have been given, or sold at a nominal price, to all bona fide settlers. Vast areas have been given to railroad companies and in aid of education. The country's Indian wards have been provided with ample reservations. The government has established great national parks, and it has reserved more than seventy-two thousand square miles of forest land.

The following tabulations give numerous important facts concerning the states and territories:

TABLE OF STATES AND TERRITORIES OF THE UNITED STATES

Date of Admission Into Union	State or Territory Origin and Meaning of Name Area and Population Motto and Meaning	Settlement Where, When, By Whom Original Territory from Which Derived	Capitals and Populations Chief Productions of State
1819	**Alabama** (Indian—Here we rest). 51,998 sq. miles. Pop. 2,348,174 Motto: *Here we rest.*	Mobile Bay, 1702, by the French. From Louisiana, Georgia, Mississippi and Alabama territories.	Montgomery: Pop. 43,464 Corn, oats, wheat, rice, cotton, sugar, iron, lumber, manufactures, potatoes,
1867	‡**Alaska** (*Al-ay-eska*, meaning "the great country"). 590,884 sq. miles. Pop. 54,899. No motto.	Three Saints, 1784, by the Russians. Purchased from Russia in 1867 for $7,200,000.	Juneau: Pop. 3,050. Seals, salmon, gold, copper, silver, lumber, tin, lead, coal.
1911	**Arizona** (Indian—Sand Hills). 113,956 sq. miles. Pop. 334,162. Motto: *Ditat deus* (Founded by God).	Tucson, 1580, by the Spanish. From New Mexico territory.	Phoenix: Pop. 29,053. Copper, gold, silver, alfalfa, fruits, live stock, wheat, barley.
1836	**Arkansas** (From a tribe of Indians). 53,335 sq. miles. Pop. 1,752,204 Motto: *Regnat populi* (The people rule).	Arkansas Post, 1685, by the French. From Louisiana, Missouri and Arkansas territories.	Little Rock: Pop. 65,142. Cotton, lumber, corn, oats, wheat, fruits, wool, coal, tobacco.
1850	**California** (From an old Spanish romance). 158,297 sq. miles. Pop. 3,426,861. Motto: *Eureka* (I have found it).	San Diego, 1768, by the Spanish. From New Albion, Upper California.	Sacramento: Pop. 65,908. Gold, silver, copper, lead, petroleum, borax, lumber, fruits, wine, olives, beet sugar.
1876	**Colorado** (Spanish—Red, or Ruddy). 103,948 sq. miles. Pop. 939,629. Motto: *Nil sine numine* (Nothing without providence).	Auroria, 1859, by the Americans. From Louisiana and Mexican cession. Colorado territory.	Denver: Pop. 256,491 Gold, silver, coal, copper, vegetables, fruits, live stock, wheat, beet sugar, oats, corn.
*1788	**Connecticut** (Indian—Long River). 4,965 sq. miles. Pop. 1,380,631. Motto: *Qui transtulit sustinet* (He who transplanted still sustains).	Windsor, 1636, by the English. From North Virginia, New England.	Hartford: Pop. 138,036. Manufactures, woolen, cotton, notions, tobacco, iron, granite, cereals.
*1787	**Delaware** (In honor of Lord De La Warr). 2,370 sq. miles. Pop. 223,003. Motto: *Liberty and independence.*	Wilmington, 1637, by the Swedes. From New Sweden, New Netherlands, three lower counties on the Delaware.	Dover: Pop. 4,042. Corn, wheat, tomatoes, fruits, manufactures, leather, iron, steel, machinery.
1791	**District of Columbia** (In honor of Columbus). 70 sq. miles. Pop. 437,571. Motto: *Justitia omnibus* (Justice to all).	Rome, 1663, by the English. Ceded to government by Maryland and Virginia.	Washington: Pop. 437,571. Flour mills, manufactures.
1845	**Florida** (Spanish—Blooming). 58,666 sq. miles. Pop. 968,470. Motto: *In God is our trust.*	St. Augustine, 1565, by the Spanish. From Florida territory.	Tallahassee: Pop. 5,637. Fruits, vegetables, tobacco, rice, cotton, lumber, turpentine, resin, fish, phosphate.
*1788	**Georgia** (in honor of George II.). 59,265 sq. miles. Pop. 2,895,832. Motto: Obverse: *Wisdom, justice moderation.* Reverse: *Agriculture and commerce.*	Savannah, 1733, by the English. One of the original thirteen states.	Atlanta: Pop. 200,616. Cotton, corn, rice, oats, tobacco, oysters, peaches, melons, marble, clay; cotton goods, lumber, fertilizers, tar.
....	‡**Hawaii** (From the native Owhyhee). 6,449 sq. miles. Pop. 255,912 No motto.	Honolulu, 1820, by the Americans. From Sandwich Islands.	Honolulu: Pop. 83,327. Sugar, fruits, rice, coffee, hides, wool, honey, sisal.
1890	**Idaho** (Indian—Gem of the Mountains) 84,313 sq. miles. Pop. 431,866. Motto: *Salve* (Hail).	Coeur d'Alene, 1842, by the Americans. From Oregon, Washington and Idaho territories.	Boise City: Pop. 21,393. Gold, silver, copper, lead, lumber, flour, wheat, oats, barley, live stock.
1818	**Illinois** (Indian—The Men). 56,665 sq. miles. Pop. 6,485,280. Motto: *National union, state sovereignty.*	Kaskaskia, 1682, by the French. From Northwest, Indian and Illinois territories.	Springfield: Pop. 59,183. Corn, wheat, oats, potatoes, hay, live stock, wool, meat, manufactures.
1816	**Indiana** (Indian's Ground). 36,354 sq. miles. Pop. 2,930,390. No motto.	Vincennes, 1702, by the French. From Northwest and Indiana territories.	Indianapolis: Pop. 314,194. Corn, wheat, tobacco, vegetables, fruits, wool, coal, clay, flour, machinery.
1846	**Iowa** (Indian—Drowsy Ones). 56,147 sq. miles. Pop. 2,404,021. Motto: *Our liberties we prize, and our rights we will maintain.*	Dubuque, 1833, by the Americans. From Louisiana, Missouri, Michigan, Wisconsin and Iowa territories.	Des Moines: Pop. 126,468. Corn, wheat, oats, potatoes, hay, live stock, butter, coal, lumber, poultry.
1861	**Kansas** (Indian—Smoky Water). 82,158 sq. miles. Pop. 1,769,257. Motto: *Ad astra per aspera* (To the stars through difficulties).	Leavenworth, 1854, by the Americans. From Louisiana, Kansas territory.	Topeka: Pop. 50,022. Corn, wheat, hay, live stock, fruits, coal, petroleum, salt, meats, Kaffir corn.
1792	**Kentucky** (Indian—Dark and Bloody Ground). 40,598 sq. miles. Pop. 2,416,630. Motto: *United we stand, divided we fall.*	Boonesboro, 1769, by the English. From Virginia.	Frankfort: Pop. 9,805. Tobacco, hemp, wheat, cotton, live stock, lumber, coal, sorghum, flour.
1812	**Louisiana** (In honor of Louis XIV.). 48,506 sq. miles. Pop. 1,798,509. Motto: *Union, justice, and confidence.*	New Orleans, 1718, by the French. From Louisiana, Territory of Orleans.	Baton Rouge: Pop. 21,782. Cotton, corn, rice, sugar, lumber, oysters, salt, sulphur.
1820	**Maine** (The Main Land). 33,040 sq. miles. Pop. 768,014. Motto: *Dirigo* (I direct).	Saco, 1623, by the English. From New England, Laconia and Massachusetts.	Augusta: Pop. 14,114. Hay, grains, dairying, potatoes, wool, granite, ice, lumber, apples, paper.
*1788	**Maryland** (In honor of Queen Henriette Maria). 12,327 sq. miles. Pop. 1,449,661. Motto: *Fatti maschii, parole femine.* (Manly deeds, womanly words).	St. Mary's, 1632, by the English. From one of the original states.	Annapolis: Pop. 11,214. Wheat, hay, corn, vegetables, fruits, oysters, coal, wool, canned fruits, vegetables.
*1788	**Massachusetts** (The Place of Great Hills). 8,266 sq. miles. Pop. 3,852,356. Motto: *Ense petit placidam sub liberate quietem* (With the sword she seeks calm peace under liberty).	Plymouth, 1620, by the English. From North Virginia, New England, Massachusetts Bay.	Boston: Pop. 748,060. Manufactures (woolen, cotton), boots, shoes, fish, tobacco, granite, marble.

*Original Thirteen States. ‡Organized Territories. Census figures for 1920.

TABLE OF STATES AND TERRITORIES OF THE UNITED STATES—Continued

Date of Admission Into Union	State or Territory Origin and Meaning of Name Area and Population Motto and Meaning	Settlement Where, When, By Whom Original Territory from Which Derived	Capitals and Populations Chief Productions of State
1837	**Michigan** (Indian—Great Lake). 57,980 sq. miles. Pop. 3,668,412. Motto: *Si quaeris peninsulam amoenam, circumspice* (If you seek a beautiful peninsula, behold it here).	Sault Ste. Marie, 1668, by the French. From Northwest, Indiana and Michigan territories.	Lansing: Pop. 57,327. Corn, wheat, oats, hay, fruits, vegetables, iron, copper, clay, lumber, manufactures.
1858	**Minnesota** (Indian—Cloudy Water). 84,682 sq. miles. Pop. 2,387,125. Motto: *L'étoile du nord* (The star of the north).	St. Paul, 1838, by the Americans. From Louisiana and Northwest and Minnesota territories.	St. Paul: Pop. 234,698. Corn, wheat, oats, barley, flaxseed, wool, live stock, flour, iron, lumber, dairying.
1817	**Mississippi** (Indian—Great River, or Father of Waters). 46,865 sq. miles. Pop. 1,790,618. No motto.	Biloxi, 1699, by the French. From Louisiana and Georgia, Mississippi territory.	Jackson: Pop. 22,817. Cotton, corn, wheat, oats, potatoes, rice, tobacco, oysters, shrimps.
1821	**Missouri** (Indian—Great Muddy). 69,420 sq. miles. Pop. 3,404,055. Motto: *Salus populi suprema lex esto* (The welfare of the people is the supreme law).	St. Genevieve, 1755, by the French. From Louisiana and Louisiana and Missouri territories.	Jefferson City: Pop. 14,490. Corn, wheat, oats, rye, cotton, swine, honey, zinc, lead, tobacco, meats.
1889	**Montana** (Spanish—A Mountain). 146,572 sq. miles. Pop. 548,889 Motto: *Oro y plata* (Gold and silver).	Yellowstone River, 1809, by the Americans. From Louisiana and Nebraska, Idaho, Dakota and Montana territories.	Helena: Pop. 12,037 Wheat, wool, live stock, fruit, oats, barley, lumber, copper, lead, silver, coal.
1867	**Nebraska** (Indian—Shallow Water). 77,520 sq. miles. Pop. 1,296,372. Motto: *Equality before the law.*	Bellevue, 1847, by the Americans. From Louisiana, Nebraska territory.	Lincoln: Pop. 54,948. Corn, wheat, oats, live stock, hay, chicory, sugar beets, fruits, potatoes.
1864	**Nevada** (Spanish—Snow-covered). 110,690 sq. miles. Pop. 77,407. Motto: *All for our country.*	Genoa, 1850, by the Americans. From Upper California and Utah and Nevada territories.	Carson City: Pop. 1,685. Gold, silver, copper, zinc, wool, live stock, lumber, borax.
*1788	**New Hampshire** (Hampshire, England). 9,341 sq. miles. Pop. 443,083. No motto.	Portsmouth, 1623, by the English. From North Virginia, New England, Laconia.	Concord: Pop. 22,167. Hay, corn, potatoes, oats, apples, granite, mica, manufactures.
*1787	**New Jersey** (In honor of governor of Jersey Island). 8,224 sq. miles. Pop. 3,155,900. No motto.	Elizabethtown, 1617, by the Dutch. From New Netherland.	Trenton: Pop. 119,289. Market garden crops, cereals, fruits, fisheries, manufactures, textiles, machinery.
1911	**New Mexico** (From Old Mexico). 122,634 sq. miles. Pop. 360,350. Motto: *Crescit eundo* (It increases by going).	Santa Fé, 1585 (?) by the Spaniards.	Santa Fé: Pop. 7,236. Gold, silver, fruits, vegetables, live stock, wool, lumber, copper, coal, turquoise.
*1788	**New York** (In honor of Duke of York). 49,204 sq. miles. Pop. 10,385,227. Motto: *Excelsior* (Higher).	New York, 1614, by the Dutch. From New Netherland.	Albany: Pop. 113, 344 Market garden crops, fruits, corn, wheat, dairying, manufactures, clothing, textiles, books, magazines, papers.
*1789	**North Carolina** (In honor of Charles II.). 52,426 sq. miles. Pop. 2,559,123. Motto: *Esse quam videri* (To be, rather than to seem).	Albemarle Sound, 1653, by the English. From Albemarle colony.	Raleigh: Pop. 24,418. Cotton, corn, tobacco, wheat, shad, oysters, lumber, mining.
1889	**North Dakota** (Indian—Allied). 70,837 sq. miles. Pop. 646,872. Motto: *Liberty and union, now and forever, one and inseparable.*	Pembino, 1859, by the Americans. From Louisiana, Minnesota and Nebraska and Dakota territories.	Bismarck: Pop. 7,122. Wheat, oats, barley, flaxseed, live stock, wool, minerals.
1803	**Ohio** (Indian—Beautiful River). 41,040 sq. miles. Pop. 5,759,394. No motto.	Marietta, 1788, by the Americans. From Northwest territory.	Columbus: Pop. 237,031. Corn, wheat, oats, hay, potatoes, fruits, tobacco, live stock, wool, dairying, coal, petroleum, salt, iron, steel, machinery, flour.
1907	**Oklahoma** (Indian—Beautiful Land). 70,057 sq. miles. Pop. 2,028,283. Motto: *Labor omnia vincit* (Labor conquers everything).	Guthrie, 1890, by the Americans. From Indian and Oklahoma territories.	Oklahoma City: Pop. 91,295. Corn, wheat, oats, cotton, flax, live stock, petroleum, minerals.
1859	**Oregon** (Spanish—Wild Marjoram). 96,699 sq. miles. Pop. 783,389. Motto: *The union.*	Astoria, 1811, by the Americans. From Oregon territory.	Salem: Pop. 17,679 Lumber, live stock, wheat, hay, fruits, hops, wool, salmon, gold, silver, paper making.
*1787	**Pennsylvania** (Latin—Penn's Woods). 45,126 sq. miles. Pop. 8,720,017. Motto: *Virtue, liberty and independence.*	Chester, 1638, by the Swedes. From original state.	Harrisburg: Pop. 75,917. Manufactures, steel, machinery, textiles, coal, coke, petroleum, natural gas, iron, grains, wool, leather.
....	‡**Philippines** (In honor of Philip II.). 114,400 sq. miles. Pop. 10,350,730	Cebu, 1565, by the Spanish. From Archipelago de San Lazaro.	Manila: Pop. 283,613. Cocoa, coffee, tobacco, cotton, hemp, cocoanuts, corn, sugar, rice, timber, dyewoods.
....	**Porto Rico** (Spanish—Rich Port). 3,435 sq. miles. Pop. 1,299,809.	San Juan, 1510, by the Spanish. Ceded by Spain.	San Juan: Pop. 70,707. Coffee, sugar, tobacco, cotton, citrus fruits, bananas, pineapples, salt.
*1790	**Rhode Island** (Rhodes, an island in the Ægean Sea). 1,248 sq. miles. Pop. 604, 397. Motto: *Hope.*	Providence, 1636, by the English. From Providence and Rhode Island plantations.	Providence: Pop. 237,595. Manufactures, worsted, cotton, jewelry, machinery, rubber, minerals.
*1788	**South Carolina** (In honor of Charles II.). 30,989 sq. miles. Pop. 1,683,724. Motto: *Dum spiro, spero. Spes* (While I breathe, I hope. Hope).	Ashley River, 1670, by the English. From Carteret colony.	Columbia: Pop. 37,524. Cotton, wheat, corn, oats, tobacco, rice, oysters, turpentine, lumber, phosphates.

*Original Thirteen States. ‡Organized Territories. Census figures for 1920.

TABLE OF STATES AND TERRITORIES OF THE UNITED STATES—Continued

Date of Admission Into Union	State or Territory Origin and Meaning of Name Area and Population Motto and Meaning	Settlement Where, When, By Whom Original Territory from Which Derived	Capitals and Populations Chief Productions of State
1889	**South Dakota** (Indian—Allied). 77,615 sq. miles. Pop. 636,547. Motto: *Under God the people rule.*	Southeast part, 1859, by the Americans. From Louisiana, Minnesota and Nebraska and Dakota territories.	Pierre: Pop. 3,656. Corn, wheat, oats, flax, potatoes, live stock, wool, gold, silver, tin, dairying.
1796	**Tennessee** (Indian—River with the Great Bend). 42,022 sq. miles. Pop. 2,337,885 Motto: *Agriculture, commerce.*	Fort Loudon, 1757, by the English. From North Carolina, territory south of the Ohio River.	Nashville: Pop. 118,342. Corn, wheat, cotton, potatoes, tobacco, live stock, coal, iron, marble, lumber.
1845	**Texas** (From tribe of Indians). 265,896 sq. miles. Pop. 4,663,228. No motto.	San Antonio, 1692, by the Spanish. From Mexican cession.	Austin: Pop. 34,876. Cotton, corn, oats, wheat, rice, sugar, live stock, wool, fruits, lumber, petroleum, coal.
1896	**Utah** (Indian—Mountain Dwellers). 84,990 sq. miles. Pop. 449,396. Motto: *Industry.*	Salt Lake City, 1847, by the Americans. From Mexican cession, Utah territory.	Salt Lake City: Pop. 118,110. Gold, silver, copper, lead, coal, vegetables, fruits, sugar, wheat, oats, live stock, wool.
1791	**Vermont** (French—Green Mountain). 9,564 sq. miles. Pop. 352,428. Motto: *Freedom and unity.*	Fort Dummer, 1724, by the English. From New Netherland, New Hampshire grants.	Montpelier: Pop. 7,125. Hay, cereals, potatoes, lumber, marble, dairying, maple sugar, manufactures, wood pulp.
*1788	**Virginia** (In honor of Elizabeth, the virgin queen). 42,627 sq. miles. Pop. 2,309,187. Motto: Observe; *Sic semper tyrannis* (Ever so to tyrants). Reverse; *Perseverando* (By perseverance).	Jamestown, 1607, by the English. From South Virginia.	Richmond: Pop. 171,667. Corn, wheat, oats, tobacco, potatoes, cotton, oysters, coal, iron, cotton manufactures.
1889	**Washington** After George Washington, first president). 69,127 sq. miles. Pop. 1,356,621. Motto: *Al-Ki* (Bye-bye).	Columbia River, 1811, by the English. From Oregon and Washington territories.	Olympia: Pop. 7,795. Lumber, coal, wheat, barley, oats, fruits, salmon, live stock, minerals.
1863	**West Virginia** (From Virginia). 24,170 sq. miles. Pop. 1,463,701. Motto: Obverse: *Montani semper liberi* (Mountaineers are always free men). Reverse: *Liberatus et fidelitas* (Liberty and fidelity).	Berkeley County, 1726, by the Americans. From Virginia.	Charleston: Pop. 39,608. Corn, oats, hay, wheat, fruits, cattle, sheep, lumber, coal, petroleum, natural gas, mining.
1848	**Wisconsin** (Indian — Wild Rushing Channel). 56,066 sq. miles. Pop. 2,632,067. Motto: *Forward.*	Green Bay, 1745, by the French. From Northwest, Illinois, Michigan and Wisconsin territories.	Madison: Pop. 38,378 Corn, oats, barley, wheat, hay, potatoes, fruits, beet sugar, dairying, iron, lumber.
1890	**Wyoming** (Indian—Extensive Plain). 97,914 sq. miles. Pop. 194,402. Motto: *Equal rights.*	Cheyenne, 1867, by the Americans. From Louisiana (chiefly), Nebraska, Dakota, Idaho, and Wyoming territories.	Cheyenne: Pop. 13,829. Wool, lumber, coal, copper, petroleum, minerals.

*Original Thirteen States. ‡Organized Territories. Census figures for 1920.

Atlanta (*ăt-lăn'tȧ*), **Ga.** [The "Gate City"; the name Atlanta was suggested by its geographical position, immediately on the dividing ridge, separating the Gulf and Atlantic waters.]

It is situated at the base of the Blue Ridge, near the Chattahoochee River; has an elevation of over one thousand feet, and a remarkably healthful climate.

Atlanta is laid out in the form of a circle, with the Union Depot as its center. A little to the south of the old Union Station is the State Capitol, which contains a library of about sixty thousand volumes and an interesting geological collection. A little to the northwest is the New Court House; and farther to the north, beyond the railway, are the Custom House and the L. & N. Freight House, an enormous concrete structure. The City Hall, the Chamber of Commerce, the Opera House, the Carnegie Library (of white marble), the Century Building, the Empire Building, the Equitable Building, the Jewish Temple, and the First Methodist Church are notable edifices. Among the chief educational establishments are the Georgia School of Technology, the Atlanta University (for colored students), the Agnes Scott Institute, and the Clark University (colored students). The finest private houses are in Peachtree Street.

Several railroads, converging at Atlanta and leading to other important Southern cities, greatly facilitate the city's extensive and rapidly increasing trade. It has a large export trade in tobacco, cotton, horses, and mules, its mule market being one of the most important in the United States. Its manufactures include implements, fertilizers, cotton goods, other foundry and machine products.

Atlanta was first settled in 1830. In 1843 it was incorporated as a town, and called Marthasville. In 1845 changed its name to Atlanta, and two years later secured a city charter. It was an important city in the Confederacy and the objective point of General Sherman's campaign. The battle of Atlanta (July 22, 1864) was fought southeast of the city. In September the city was made a military camp by Sherman, and in November he left the city in flames, and started on his "march to the sea." The city was almost entirely destroyed, but recovered rapidly after the war, and in 1878 became the capital of Georgia.

Baltimore (*bôl'tĭ-mōr*), **Md.** [The "Monumental City"; named for the proprietor of a large tract of land in Maryland, Cecil Calvert, Lord Baltimore, who settled the province in 1635.]

It is situated on an estuary of the Patapsco River, at the head of navigation, about fourteen miles from Chesapeake Bay, and is on the Baltimore and Ohio, the Philadelphia, Baltimore and Washington, and other railroads. A good harbor and fine geographical situation give Baltimore unusual trade advantages, and it has become one of the great export centers of the United States.

The city is roughly divided into two nearly equal parts by a small stream, Jones Falls, which flows entirely through the city. The portion of the city northeast of the stream is called "Old Town." Baltimore Street is the chief longitudinal thoroughfare.

The natural center for the visitor is Mt. Vernon Place, a small square, prettily laid out and suggesting Paris in its tasteful monuments and surrounding buildings. In the middle rises the Washington Monument, a column one hundred and thirty feet high, surmounted by a colossal statue of George Washington.

At the northeast corner of the square is the handsome Mt. Vernon Methodist Episcopal Church; at the southeast corner, Peabody Institute, for the encouragement of science, art, and general knowledge.

On the south side of the square is the house of Henry Walters, connected by an overhead bridge with a new picture-gallery containing the celebrated Walters Collection, one of the finest private collections of art in America.

Charles Street, one of the chief thoroughfares of the city, leads to the north from the Washington Monument past the Union Station, near which, at the north end of the B. & O. tunnel, is the Mt. Royal Station. Following Charles Street to the south we pass (right) the First Unitarian Church and the back of the Roman Catholic Cathedral, which faces Cathedral Street. The latter is surmounted by a dome one hundred and twenty-five feet high, and contains some interesting paintings. Adjacent is the residence of the Cardinal.

Farther on Charles Street passes the Masonic Temple, intersects Baltimore Street, the chief business street of the city, and is continued to South Baltimore. In East Fayette Street, to the left, is the Court House, a handsome white marble building, and the Post Office, in front of which rises the Battle Monument, erected in 1815 in memory of the struggles of the war of 1812-1814. The interior of the Court House is adorned with admirable mural paintings. To the east of the Post Office is the City Hall, a large and handsome building, with a dome two hundred and sixty feet high.

To the south of the City Hall, in Gay Street, between Water and Lombard Streets, is the imposing new Custom House, which was damaged by the fire of 1904, but has since been repaired and completed.

A little to the west of Mt. Vernon Place, between Howard St. and Eutaw St., are the unpretentious buildings formerly occupied by Johns Hopkins University, one of the foremost institutions of learning in the country. It was endowed with over three million five hundred thousand dollars by Johns Hopkins, a Quaker. In 1902 a suburban site about two miles north of the Washington Monument was secured for this famous university, and the first of a fine group of buildings was occupied by it in 1914.

The Johns Hopkins Hospital, opened in 1889, is also due to the liberality of Mr. Hopkins, who bequeathed over three million dollars for its foundation.

Both as a scientific and charitable institution, this hospital is an important adjunct to the University; and in the completeness of its equipment and excellence of its system, it ranks with the foremost hospitals in the world. The buildings of the Medical School of Johns Hopkins University adjoin the hospital.

Druid Hill Park, a pleasure-ground of about seven hundred acres, owes its beauty in great part to the fact that is has been preserved as a private park for one hundred years before passing into the hands of the city. Its hills afford beautiful views. Druid Lake, one-half mile long, is one of the reservoirs of the city waterworks.

Baltimore is an important center of the traffic in breadstuffs, and is also the seat of extensive and varied industries—cotton and woolen goods, flour, tobacco and cigars, beer, glassware, boots and shoes, iron and steel (including machinery, car-wheels, iron bridges, stoves, furnaces, etc.), clothing, pianos, organs, and the canning of oysters. Shipbuilding has become an important development, and Sparrows Point, with its immense Bessemer steel plant, is a place of great industrial activity.

The construction of the first important line of railway in the United States was begun at Baltimore in 1828 and carried on by private enterprise, and the first telegraph line was constructed to, and the first message received in, Baltimore. In 1904 Baltimore was visited by a fire which consumed fifty million dollars' worth of property.

SOME VIEWS IN BOSTON, MASSACHUSETTS:

THE CHARLES RIVER EMBANKMENT

Boston (*bôs'ton*), **Mass.** [Called the "Hub" and "Athens of America"; name is derived from Boston, a seaport in England, originally called Botalf, or Botolph's town.]

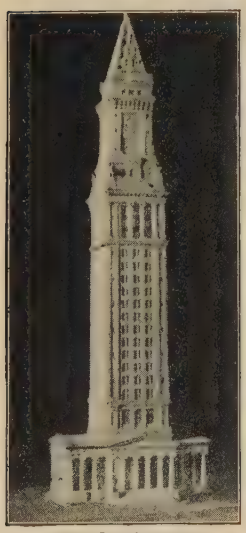
The capital of Massachusetts, the chief town of New England, Boston is one of the oldest and most interesting cities of the United States. Whether considered from the point of view of its educational and charitable institutions, its trade, manufactures and public buildings, its influence upon the intellectual life and literary culture of the nation, or its historic part as an inspirational center of political liberty and social reform, its record and position command attention.

In no other American city are the civic and other public buildings more closely associated with events of national importance.

Boston is situated at the head of Massachusetts Bay, about two hundred miles northeast of New York, and occupies a peninsula between the Charles River and the arm of the bay known as Boston Harbor. Originally the town was founded on three hills, Beacon, Copp's and Fort, which, however, have been materially cut down. The metropolitan area now includes also East Boston, on Noddle's or Maverick Island, on the other side of the harbor; South Boston, separated from the old city by an arm of the harbor; Charlestown, on the other side of the river; and the suburban districts of Brighton, Roxbury (or Boston Highlands), West Roxbury (including Jamaica Plain), and Dorchester. Boston is connected with the city of Cambridge by several bridges across the Charles. The old town is cramped and irregular, and its streets are narrow and crooked; but the new parts, especially the so-called Back Bay, formed by filling in the tide-water flats on the Charles, are laid out on a very spacious scale.

The chief retail business streets of Boston are Washington Street and Tremont Street. Among the finest residence streets are Commonwealth Avenue, Beacon Street, Marlborough Street, Mt. Vernon Street, and Bay State Road.

Boston Common, a park of forty-eight acres in the heart of the city, shaded by fine elms and



CUSTOM HOUSE

TRINITY CHURCH COPLEY-PLAZA HOTEL

RIVER FRONT, PARKS AND NOTABLE BUILDINGS

STATE HOUSE BOSTON COMMON TREMONT STREET

other trees and crossed by many pleasant walks, has been reserved for public use since 1634 and is carefully guarded for this purpose in the charter of 1822. Just across Charles from the Common is the fine Public Garden, reclaimed from what was low-lying waste land.

That part of the Common adjoining Tremont Street and known as the Tremont Street Mall is now occupied by eight small buildings, covering the entrances to the stations of the Boston Subway, a wonderful piece of engineering that facilitates traffic by an underground system of electric cars. The subway was, in part, constructed in 1895-1898, at a cost of about four million one hundred and sixty-five thousand dollars, and since greatly extended by the expenditure of many millions more.

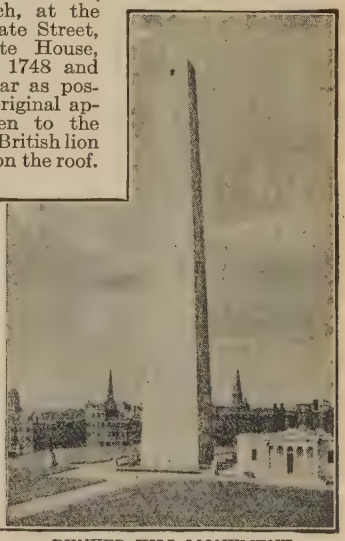
Near the northeast angle of the Common, on Beacon Hill, stands the State House, an imposing building surmounted by a huge gilded dome, and preceded by a Corinthian portico and a flight of steps. On the terrace in front are statues of Daniel Webster and Horace Mann. The dome is illuminated at night.

In Beacon Street, opposite the State House, is the beautiful Shaw Monument, by Saint-Gaudens, erected in honor of Colonel Shaw and his regiment, the first colored regiment raised during the Civil war.

In Pemberton Square is the new County Court House, a massive granite building in the German Renaissance style, with an imposing central hall adorned with emblematic figures. In School Street, to the left, is the City Hall, behind which was the Old Court House. In front of the City Hall are statues of Franklin and Josiah Quincy.

School Street ends at the large Old South Building in Washington Street, the most crowded thoroughfare in Boston, with many of the best shops. Following Washington Street ("Newspaper Row") to the left, we soon reach, at the corner of State Street, the Old State House, dating from 1748 and restored as far as possible to its original appearance, even to the figures of the British lion and unicorn on the roof.

PIERCE BUILDING PUBLIC LIBRARY



BUNKER HILL MONUMENT

State Street, the center of financial life, leads to the east, past the Exchange Building (with the Stock Exchange) and other large office buildings, to the Custom House, a massive granite building in the shape of a Greek cross, with lofty tower.

Change Alley (now inappropriately styled "Avenue"), diverging to the left from State Street leads to Faneuil Hall, the "cradle of American liberty," originally presented to the city in 1742, by Peter Faneuil, a Huguenot merchant, but rebuilt after a fire in 1761 and reconstructed on the original plan in 1898.

Devonshire Street leads to the right from State Street to the Government Building, a huge edifice occupying the entire block between Milk Street, Devonshire Street, Water Street and Post Office Square. The Post Office occupies the ground floor, the basement, and part of the first floor, while the rest of the building is devoted to the United States Sub-Treasury and the United States Courts.

At the corner of Washington Street stands the Old South Meeting House, built in 1729 on the site of an earlier church of wood, which lay near Governor Winthrop's house.

Boylston Street, another important thoroughfare, diverging from Washington Street to the right, skirts the Common and Public Garden and leads to the Back Bay. At the corner of Berkeley Street (right) stands the Museum of Natural History, with a library of thirty thousand volumes and good zoological, ornithological, entomological and mineralogical collections. Opposite is the Berkeley Building, a structure of a fine commercial type. Adjacent are old buildings of the Massachusetts Institute of Technology, one of the leading institutions of the kind in the world. It now occupies a magnificent group of buildings on the Cambridge side of the Charles River, erected at a cost of ten million dollars.

Boylston Street now reaches Copley Square, which offers perhaps the finest architectural group in Boston, including Trinity Church, the Copley-Plaza Hotel, the Public Library, the New Old South Church, and a number of imposing business structures. (See illustrations.)

Trinity Church, on the east side of the square, the masterpiece of H. H. Richardson and a typical example of "Richardsonian" architecture, is deservedly regarded as one of the finest buildings in America. Its style may be described as a free treatment of the Romanesque of Central France.

The Public Library, on the west side of the square, designed by McKim, Mead & White, and erected in 1888-1895, is a dignified, simple and scholarly edifice which forms a worthy mate to the Trinity Church. Its style is that of the Roman Renaissance.

The New Old South Church, so called as the successor of the Old South Church, is a fine building in the Italian Gothic style, with a tower two hundred and forty-eight feet in height. The marbles and ornamental stone work are very fine.

Huntington Avenue, which diverges to the left from Boylston Street at Copley Square, contains many important buildings. This thoroughfare, and the district known as the Back Bay Fens, is celebrated for its cultural institutions. Among them are Mechanics Hall, Horticultural Hall, the imposing Symphony Hall, the New England Conservatory of Music, and the new Opera House —all in Huntington Avenue. Just beyond this is the New Museum of Fine Arts, a large granite edifice by Guy Lowell, admirably adapted for its ends. Farther out, at the corner of Longwood Avenue, are the extensive new buildings of the Harvard Medical School, erected at a cost of five million dollars, and equipped in the most complete and up-to-date manner.

Commonwealth Avenue, which runs parallel with Boylston Street, is one of the finest residence streets in America, with rows of trees and handsome houses. It is two hundred and forty feet wide and adorned with statues.

Beacon Street, beginning on Beacon Hill, skirting the north side of the Common, and then running parallel with Commonwealth Avenue is the aristocratic street of Boston. Its back-windows command a fine view of the Charles River.

The Back Bay, the fashionable west end district traversed by the above-named streets, was at the beginning of the nineteenth century occupied by dreary mud-flats, salt-marshes and water.

The Back Bay Fens have been skillfully laid out on the site of unsightly swamps and form the first link in the splendid chain of parks and boulevards, of which Franklin Park is the chief ornament. The chief entrances to the Fens are marked by a gateway and a fountain; and at the end of Boylston Street is a fine memorial of John Boyle O'Reilly, by D. C. French.

Fenway Court, the residence of Mrs. John L. Gardner, a building in a Venetian style, enclosing a courtyard and incorporating many original balconies, windows, and other details brought from Italy, contains a choice collection of art, which is open to the public from time to time.

Franklin Park is five hundred and twenty acres in extent and lies in West Roxbury (reached by electric car). It abounds in natural beauty and many of its drives and walks are very attractive.

The Public Park System of Boston, as a whole, is almost unique. The City Park System, with a total area of twenty-four hundred acres, forms an almost unbroken line of parks and parkways from the Public Garden to City Point, in Boston Harbor. The Metropolitan System, forming an outer line of parks, has an area of eleven thousand acres, including two large wooded reservations (Blue Hills, and Middlesex Fells), three beaches (Revere Beach, Nantasket Beach, and Lynn Beach), and the boating section of the Charles River. When completed this system will afford fifty miles of drives.

The North End of Boston, embracing the site of Copp's Hill, now one of the poorer districts and occupied mainly by foreigners, contains some points of considerable historical interest. The Copp's Hill Burial Ground, dating from 1660, contains the graves of Increase, Cotton and Samuel Mather. Adjacent, in Salem Street, is Christ Church, the oldest church now standing in the city (1723), on the steeple of which the signal-lanterns of Paul Revere are said to have been displayed on April 18th, 1775, to warn the country of the march of the British troops to Lexington and Concord. North Square is the center of what is known as "Little Italy." The House of Paul Revere has recently been restored and contains some relics.

Within metropolitan Boston are many famous institutions of learning. At the head of these stand Harvard University, Massachusetts Institute of Technology, and Radcliffe College, the greater part of whose schools are in the adjoining city of Cambridge and the remaining in Boston. Among the institutions of higher education are Boston University, with its affiliated colleges, its schools of law, medicine, and theology, and its post-graduate department in philosophy, science, and language; the medical, dental, and agricultural schools of Harvard University; Boston College; the medical and dental schools of Tufts College; Simmons College for Women; the New England Conservatory of Music; the Massachusetts Normal Art School; the Lowell Institute; and the Massachusetts College of Pharmacy.

Wellesley College is situated in the beautiful village of Wellesley, about fifteen miles from Boston, on Lake Waban.

Besides Trinity Church, already referred to, there are upward of three hundred other edifices. Chief of these are the Cathedral of the Holy

Cross, on the corner of Washington and Malden Streets, the largest and most noteworthy Catholic church in New England; Arlington Street Church, corner of Arlington and Boylston Streets; First Church of Christ, Scientist, on Falmouth Street, corner of Norway; and Tremont Temple, a Free Baptist Church.

The beauty of the parks, squares, and of many public buildings is enhanced by monuments and statues, of which the following are the chief: Bunker Hill Monument in Charlestown, two hundred and twenty feet high, built of granite and commemorative of the resistance and heroism of American patriots at the Battle of Bunker Hill; the equestrian statue of Washington in the Public Garden; the monument to Colonel Shaw; the Soldiers' Monument in the Common; the Crispus Attucks monument, a memorial of the Boston Massacre of 1770; statues to General Joseph Warren, Edward Everett, Charles Sumner, Alexander Hamilton, Governor Winthrop, William Lloyd Garrison, Benjamin Franklin, Josiah Quincy, Beethoven, Daniel Webster, Horace Mann, Phillips Brooks and many other notable men.

The principal industries of Boston are the manufacture of food preparations, clothing, building, printing, publishing, and book-binding, distilled liquors, machinery, metals and metallic goods, and furniture. Other important manufactures include musical instruments, woolen goods, boots and shoes, rubber goods, tobacco, and drugs and medicines. As a commercial port, Boston ranks next to New York, the value of foreign trade amounting to two hundred million dollars annually. After London, the city is the leading wool market of the world.

Boston was settled in 1630 by a party of Puritans from Salem. A memorable massacre occurred here in 1770, and in 1773 several cargoes of English tea were thrown overboard in the harbor by citizens. The battle of Bunker Hill was fought on Breed's Hill, within the present city limits, June 17, 1775. The city charter was granted in 1822.

Cambridge (*kām'brĭj*), **Mass.** [So named for the English university town of that name. The English name is supposed to mean "the bridge over the river Cam," the real name of which is the Granta.]

It is virtually a suburb of Boston, from which it is separated by the Charles River, and with which it is connected by several bridges. The city comprises Old Cambridge, the seat of Harvard University, North Cambridge, East Cambridge, Cambridgeport, and Mount Auburn. The streets are broad and shaded with elms, and there are many places of historical and literary interest, among these the Craigie House and "Elmwood," the homes of Longfellow and Lowell, respectively; and Mount Auburn Cemetery, containing the graves of Longfellow, Lowell, Prescott, Motley, Agassiz, Holmes, and other noted men.

The chief interest of Cambridge, however, lies in its educational institutions, which include Harvard University, Radcliffe College (for women), Massachusetts Institute of Technology, Episcopal Theological School, and Andover Theological Seminary. All these institutions are now in close working alliance with Harvard University.

Harvard University, founded in 1636, is not only the oldest but the richest of American universities, and the roster of graduates contains more than twenty thousand names. Massachusetts Hall is the oldest of the present buildings, being built in 1720. The most notable buildings architecturally (besides the fine Medical School group in Boston) are: Austin Hall and Longdell Hall, devoted to the Law School; Widener Memorial Library, a splendid new building dominating the college yard; Busch Hall, devoted to the art collections of the Germanic Museum; Memorial Hall, containing Sanders Theater; and Sever Hall, containing class-rooms.

The activities of the university require upward of sixty other buildings, including laboratories, lecture halls, museums, residence halls, and a number of fine structures devoted to the social, religious, athletic and art life of the student body.

The Massachusetts Institute of Technology, founded in 1861, is located on the Charles River Parkway, and occupies a newly acquired area of about seventy acres. Here has been erected a magnificent group of buildings, unrivaled, perhaps, in design, adaptation for their respective uses, and general equipment. This institution is devoted to the teaching of science as applied to the various engineering professions—civil, mechanical, mining, electrical, chemical, and sanitary engineering—as well as to architecture, chemistry, metallurgy, physics, and geology.

Among the industrial establishments are foundries, machine shops, and extensive manufactories. The Riverside, Athenæum, and University Presses are well-known printing establishments, and the "Bay Psalm Book," the first book printed in America, was published in Cambridge in 1640.

Cambridge was settled in 1630 by Governor Winthrop under the name of Newtowne. In 1636 Harvard College was founded at Newtowne, and in 1638 Newtowne became Cambridge. The Washington elm, under which Washington received command of the American troops, is still standing.

Under this ancient elm near the Cambridge Common, Washington assumed command of the American Continental army July 3, 1775, by order of the Continental Congress. It is therefore one of the landmarks of the greatest historic interest to every liberty-loving American—man, woman, or child.

1. Blackstone Hotel 2. Harvester Building 3. Congress Hotel 4. Auditorium Hotel 5. Fine Arts Building 6. Chicago Club 7. McCormick Building 8. Stratford Hotel

MICHIGAN BOULEVARD AND GRANT PARK, CHICAGO,

Chicago (*shĭ-kä'gō*), **Ill.** [The "Windy City"], probably received its name from the Indian *Checagua*, meaning "wild onion" and "pole-cat."

It is the second city and largest railway center of the United States, and is situated on the southwest shore of Lake Michigan, at the mouths of the rivers Chicago and Calumet, five hundred and ninety feet above sea level and fifteen to seventy-five feet above the lake. It is eight hundred and fifty miles from Baltimore, the nearest Atlantic port, and two thousand four huudred and fifteen miles from San Francisco.

Chicago is noted for the magnitude of its commercial enterprises; for the greatness of its financial institutions; for the excellence of its parks and public playgrounds—particularly in the number, equipment, and splendid use of its small parks in congested localities; for its universities, its efficient public-school system, and for other educational, artistic, and morally uplifting institutions that give to it an enlightened, a cultured, and a progressive citizenship.

It is estimated that not more than 350,000 of the inhabitants are of native American parentage; about 550,000 are Germans, 250,000 are Irish, 225,000 Scandinavians, 160,000 Poles, 110,000 Bohemians, 40,000 Italians, 60,000 Canadians, and 100,000 English and Scottish. There are some fourteen languages, besides English, each of which is spoken by ten thousand or more persons.

The city has a water-front on the lake of twenty-six miles and is divided by the Chicago River and its branches into three portions, known as the North, South, and West Sides, to which must be added the "Loop," or business part of the city. The site of the city is remarkably level, rising very slightly from the lake; and its streets are usually wide and straight. Among the chief business-thoroughfares are State, Clark, Madison, Randolph, Dearborn, and La Salle Streets, and Wabash Avenue. Perhaps the finest residence streets are Prairie and Michigan Avenues and Drexel and Grand Boulevards, on the South Side, and Lake Shore Drive, on the North Side.

A splendid bird's-eye view of Chicago is obtained by ascending to the top of the tower of the Auditorium on Congress Street and Michigan Boulevard. This huge building, erected in 1887-1889 at a cost of three million five hundred thousand dollars, includes a large hotel and a handsome theater. The Fine Arts or Studebaker Building, adjoining the Auditorium, on Michigan Boulevard, is one of the show buildings of Chicago, and has deservedly been described as the focus of the artistic and intellectual life of Chicago, containing as it does a theater, concert, assembly, and lecture rooms, studios of leading artists, and the meeting-places of several clubs. The beautiful Romanesque building to the north of the Fine Arts Building is the Chicago Club. A little farther to the north, at the corner of Jackson Boulevard, is the tall Railway Exchange Building, erected in 1903-1904, and cased in tiles. Next to this on the north is the new building of the Chicago Orchestra Association, on the roof of which is the house of the "Cliff Dwellers," a literary and artistic club. A little to the south of the Auditorium, at the corner of Harrison Street, is the Harvester Building, erected in 1907, beyond which is the palatial Blackstone Hotel. A little farther to the south is the Illinois Central Station.

Following Michigan Avenue toward the north from the Auditorium, we reach the Art Institute of Chicago, an imposing building in a semi-classical style, containing a valuable collection of paintings, sculptures, and other objects of art. Opposite is the magnificent People's Gas Building, erected at a cost of eight million dollars.

Farther to the north, on the opposite side of Michigan Avenue, are the buildings of the Illinois Athletic Club, the University Club, and the Chicago Athletic Club. At the corner of Madison Street is the Montgomery Ward Building, with its tower, and a little farther up, at the corner of Washington Street, is the Chicago Public Library, an imposing building in a classical style, erected in 1893-1897, at a cost of two million dollars.

This fine edifice is worthy to rank with the Library of Congress and the Boston Public Library. The main entrances are to the north and south, in Randolph Street and Washington Street. The interior is sumptuously adorned with marble, mosaics, frescoes and mottoes. It contains three hundred and fifty thousand volumes. On the first floor is a large Memorial Hall, used by the Grand Army of the Republic and covered by a dome; it contains an interesting collection of Civil War and other historical relics.

On the north, Michigan Avenue ends at the Chicago River. Fort Dearborn stood to the left, on the river, at the end of the avenue.

The business quarters of Chicago occupy

9. Railway Exchange 10. Orchestra Hall 11. Pullman Building 12. Gas Building 13. Lake View Building 14. Illinois Athletic Club 15. Monroe Building 16. University Club 17. Ward Building

VIEWED FROM THE WEST SHORE OF LAKE MICHIGAN

chiefly the great central district called the "Loop," which is bounded by the lines of the Elevated Railway. We may follow Randolph Street to the west to the City Hall and County Building, two large adjoining buildings, in a modern classical style with huge Corinthian columns, built at a cost of five million dollars.

La Salle Street, leading to the south from the County Building, contains some of the finest office buildings in the city. Among these are the Chamber of Commerce at the corner of Washington Street; the Tacoma Building at the corner of Madison Street; the Y. M. C. A. Building, a little farther to the south; the New York Life Insurance Building; the low but impressive Northern Trust Co. Building, and the oddly shaped Women's Temperance Temple, all three at the corners of Monroe Street; the new granite building of the Corn Exchange National Bank, the Home Insurance Co. Building, and the Rookery, with a very attractive interior lined with white marble. Farther on in La Salle Street, at the corner of Jackson Boulevard, is the Illinois Trust & Savings Bank, a massive two-storied edifice, with a fine central court. At the end of La Salle Street stands the granite building of the Board of Trade.

Jackson Boulevard leads hence to the east to the Federal Building, containing the Post Office and Custom House and occupying an entire city square. It is in the Corinthian style, with a large central dome two hundred feet in height.

Other notable buildings within the "Loop" district include: the Continental and Commercial Bank, Hotel La Salle, First National Bank, and the great department store, office, newspaper, and hotel buildings.

The park system of Chicago is without a parallel in America; it embraces Lincoln Park, on the lake shore to the north, and six others, and is divided into three sections, all connected or nearly so by magnificent boulevards, which, with the park drives, measure over sixty miles. In all, Chicago has ninety-three parks, covering more than four thousand four hundred acres. A characteristic feature of the system is the large number of small "People's Parks" scattered through the poorer districts and provided with baths, gymnasiums and playgrounds. On the north side is Lincoln Park, reached via Lake Shore Drive, one of the finest residence streets in Chicago, containing some very handsome houses. This passes near the Water Works, at the foot of Chicago Avenue, and ends on the north at Lincoln Park, which is at present three hundred acres in area, but is being extended by filling in the adjacent shallows of Lake Michigan.

Among the attractions of this park are the conservatories, palm-house, lily-ponds, and flower-beds; a small zoological collection; a fountain illuminated at night by electric light; the statues of Lincoln (by Saint-Gaudens), Grant (by Rebisso), Beethoven, Schiller, La Salle, a Mounted Indian, and Linnaeus; and the boating lake. Near the main entrance is the Academy of Sciences, containing admirably arranged and classified collections illustrating the various natural sciences.

Grant Park, consisting of a public pleasure ground of two hundred and ten acres, lies between Michigan Boulevard and Lake Michigan. This park has been improved of late by the depression of the tracks of the Illinois Central Railway and by the construction of massive stone viaducts connecting the park proper with the lake shore. The adjoining part of the lake, between the shore and the breakwater, has been filled in and added to the park. In Grant Park, to the south of the Auditorium and opposite Eldredge Place, is an equestrian statute of General John A. Logan, in bronze, by Saint-Gaudens.

The South Side parks are also fine. They are best reached by Michigan Avenue and Drexel Boulevards, two fine residence streets with tasteful houses and ornamental gardens. Michigan Avenue also contains several churches, the Calumet Club, numerous large hotels and apartment houses, and the First Regiment Armory. In Drexel Boulevard is the handsome Drexel Memorial Fountain.

Washington Park (three hundred and seventy-one acres) and Jackson Park (five hundred and twenty-three acres) are connected by a wide boulevard known as the Midway Plaisance, on which is located the University of Chicago.

The West Side parks, Douglas Park, Garfield Park, and Humboldt Park are little inferior to those of the North and South Sides.

The University of Chicago, between Fifty-sixth and Fifty-ninth Streets, occupies probably the finest group of buildings, architecturally, devoted to higher education in the United States. The total value of buildings and equipment is more

than thirty million dollars, one-fourth of which was contributed by citizens of Chicago and the balance by John D. Rockefeller. The ground has an area of sixty-six acres, and the university includes faculties of Arts, Literature, Science, Commerce and Administration, Education, Medicine, Law, and Divinity.

Above thirty different buildings have already been erected, mainly of limestone and in a Gothic style, from the designs of H. I. Cobb and Mr. Coolidge. Perhaps the most successful group is that at the corner of Fifty-seventh Street and Lexington Avenue, including an Assembly Hall, a Students' Club House, the University Tower, and the University Commons. Other important buildings are the Cobb Lecture Hall, the Kent Chemical Laboratory, the Ryerson Physical Laboratory, the Law School, the Anatomy, Physiology, Zoology, and Botany Buildings, the Walker Museum, the Haskell Oriental Museum, the handsome Bartlett Gymnasium, dormitories for women and dormitories for men. On the south edge of the campus stands the main structure of the Harper Memorial Library, an enormous Gothic building by Shepley, Rutan & Coolidge, erected in memory of President Wm. R. Harper. The Yerkes Observatory, at Williams Bay on Lake Geneva, containing one of the largest refracting telescopes in the world, belongs to the University of Chicago. Connected with the University is the large School of Education, facing the Midway Plaisance, between Monroe and Kimbark Avenues.

Other notable educational institutions include the Lewis Institute, founded and endowed by the late Mr. A. A. Lewis and opened in 1896, comprising a School of Arts and a School of Engineering, tuition in which is furnished at a nominal cost; and the Armour Institute, a well equipped institution for higher technical education, endowed by its founder with three million dollars.

Hull House, at the southwest corner of Polk and South Halsted Streets, is a social settlement of men and women, furnishing a social, intellectual, and charitable center for the surrounding district. It includes a free kindergarten, a coffee-house, a residential boys' club, a theater, a labor-museum, and a free gymnasium, while classes, lectures, and concerts of various kinds are held.

The famous Union Stockyards ("Packingtown") are in South Halsted Street, five and one-half miles to the southwest of the City Hall, and may be reached by the South Halsted Street or Racine Avenue trolley-lines, both running directly to the main entrance at Forty-first Street. The yards proper cover an area of about five hundred acres, have twenty-five miles of feeding-troughs, and twenty-miles of water-troughs, and can accommodate seventy-five thousand cattle, three hundred thousand hogs, fifty thousand sheep, and five thousand horses. From two-thirds to three-fourths of the cattle and hogs are killed in the yards, and sent out in the form of meat. About thirty thousand workers are employed by the packing-houses. Chicago is the greatest live stock and grain market in the world.

Among the more important general manufactures of the city may be mentioned those of railway cars, locomotives, agricultural implements, mining appliances, clothing, electrical apparatus, lumber products, furniture, pianos, organs, leather, cigars, chemicals, beer, spirits, and flour. The steel and iron industry is conducted on a large scale, and the city has some large rolling mills. Chicago is also one of the leading publishing centers of the United States, and is an active jobbing center for the book trade.

As a center of railroad industry Chicago takes precedence over all cities of the world. Twenty-six of the principal trunk-line railroads of the United States run trains into Chicago terminals, and in addition to these there are numerous belt transfer, terminal and industrial lines which have either a part or all of their trackage in the city. Within the corporate limits of the city are eight hundred miles of main line railway and one thousand four hundred miles of auxiliary track. The total mileage of the twenty-six roads entering Chicago approximates ninety-seven thousand miles, or about forty-two per cent of the total mileage of the United States. The land occupied by main line property within Chicago represents nine thousand six hundred acres, or eight per cent of the entire area of the city.

There are six principal passenger terminals in Chicago, located as follows:

Baltimore & Ohio Terminal (Grand Central Station), at Fifth Avenue and Harrison Street. Central Station, at Michigan Avenue and Twelfth Street. Chicago & North Western Passenger Terminal, at North Clinton, West Madison, and North Canal Streets. La Salle Street Station, with entrance on Van Buren Street. Dearborn Station, at Dearborn and Polk Streets. Union Passenger Station, at Adams and Canal Streets.

Present plans are under way, however, to concentrate all roads entering Chicago in three great union stations—the North Western Station (already built, at a cost of $25,000,000), the Illinois Central Station, and the Pennsylvania Station, the two latter involving an expenditure of one hundred and fifty million dollars.

The water carrying trade of Chicago is comparable to that of New York and Boston, and exceeds that of Philadelphia, New Orleans, Baltimore, and San Francisco.

The Chicago Tunnel System involves a labyrinth of small tunnels or subways, six by seven and one-half feet in size, and sixty-two miles long, forty feet under the principal business streets within the Loop district. These tunnels connect with all railway freight depots, passenger stations and, through their sub-basements, with a number of the larger mercantile concerns. They also extend beyond the Loop—north, south, and west—a distance of about two miles. They are not designed for passenger traffic, but are used by cars laden with all sorts of merchandise, coal, ashes, etc.

There are three underground power stations, four universal freight and transfer stations (one of them occupying five floors below the ground), eighty-five ordinary stations, and twelve tunnels, extending sixty feet under the Chicago River or its branches. So far, between thirty million and forty million dollars have been expended on construction and equipment. The bores also contain the cables of the automatic telephone company.

The site of Chicago was first visited by Joliet and Marquette in 1673. The United States Government established there the frontier post of Fort Dearborn in 1804. On October 8 and 9, 1871, occurred the memorable fire which reduced the greater part of the city to ashes. In 1886 occurred the Haymarket riot, in 1893 the World's Columbian Exposition was held in Chicago, and in 1894 the Pullman strike, the greatest in history, centered in Chicago.

Cincinnati (*sin-si-nä'ti*), **Ohio.** [The "Queen City," named in honor of Cincinnatus, the Roman patriot.]

It is the second city of Ohio, on the north bank of the river Ohio, two hundred and seventy miles southeast of Chicago by rail, opposite the cities of Covington and Newport, in Kentucky. Steam ferries and six lofty bridges connect the city with the Kentucky shore; the suspension bridge by Roebling is two thousand two hundred and fifty feet long, and cost one million eight hundred thousand dollars.

Cincinnati occupies an exceedingly broken and irregular site, the more densely built parts being

enclosed between the Ohio River and steep hills. The river front is upwards of fourteen miles in length. A second terrace is fifty or sixty feet higher, and a district between the hills and the Miami Canal, known as "over the Rhine," is occupied by the large German colony.

The main portion of the city is regularly laid out and its streets are well paved. The chief shopping district is bounded by Fourth, Main, Seventh, and Elm Streets. The best residential quarters are on the surrounding highlands, built on a succession of irregular hills, by whose steepness they are broken into a series of some five and twenty villages, interspersed with parks.

Fountain Square, an expansion of Fifth Street, may, perhaps, be called the business center of the city and from it start most of the street railway lines. In the middle of the square stands the Tyler Davidson Fountain, cast at the Royal Bronze Foundry at Munich. To the north, at the corner of Fifth Street and Walnut Street, is the United States Government Building containing the Post Office, Custom House, and United States Law Courts, erected at a cost of five million dollars. It is of sawed freestone in the Corinthian style.

By following Fifth Street to the west and turning to the left down Vine Street, we pass the entrance to the Emery Arcade and reach, at the corner of the busy Fourth Street, the Chamber of Commerce. Opposite, at the northeast corner of Fourth and Vine Streets, stands the Ingalls Building. On the north side of Fourth Street, between Vine and Race Streets, is the fine Third National Bank.

Following Fourth Street towards the west, we soon reach Plum Street, which we may follow to the right to St. Paul's Protestant Cathedral, at the corner of Seventh Street; the Roman Catholic Cathedral of St. Peter, at the corner of Eighth Street, and the Synagogue, opposite the last. In the block bounded by Central Avenue and Eighth, Ninth and Plum Streets is the City Hall, a large red building in a Romanesque style, with a lofty tower, constructed of brown granite and red sandstone at a cost of one million six hundred thousand dollars. A little to the east, in Vine Street, between Sixth and Seventh Streets, is the Public Library. To the north of this point, "over the Rhine," is Washington Park, with the Springer Music Hall and the Exposition Building.

Among other buildings may be mentioned the County Court House, St. Xavier's College, the Oddfellows' Temple and the Cincinnati Hospital. Recent buildings of the modern type include the Traction Building, the Mercantile Library, the Union Trust Building, and the First National Bank.

The chief park of Cincinnati is Eden Park, which lies on the hills to the east and affords fine views of the city and river. It contains the Art Museum, a storage reservoir of the City Water Works, and the Water Tower. The top of the last affords the best view of the city and its environs, the river, and the Kentucky Highlands.

The Art Museum is a handsome group of buildings on a hill-top, some in a Romanesque, others in a Grecian style. Adjacent is the Art Academy. Both are maintained by a private corporation.

There are more than two hundred and fifty churches, including a Roman Catholic cathedral; besides many handsome theaters, hotels, and public halls, hospitals and asylums, and schools.

The educational institutions are of the highest order. They include the University of Cincinnati, which has associated with it the Cincinnati Hospital and the Cincinnati Observatory, the Ohio and Miami Medical Colleges, St. Joseph's and St. Xavier's Jesuit Colleges, the Law Theological Seminary, Cincinnati Conservatory of Music and the Ohio Mechanics' Institute.

Cincinnati is a center of musical and art culture, and its decorative pottery and wood-carving have a national reputation. It has a large river and canal traffic, and many railways converge here.

Among the factories are clothing factories, foundries, machine shops, coach-works, works for the manufacture of furniture, tobacco, shoes, leather, etc. There is some boat-building and printing; and the slaughter-houses, stockyards, and grain elevators are very extensive.

Cincinnati was settled by white men in 1780, was incorporated as a city in 1819, and early attained the name of "the Queen City of the West;" as also that of "Porkopolis," from its great trade in pork. Great riots occurred in 1884, and were with difficulty suppressed by the military.

Cleveland, Ohio. [The "Forest City;" named in honor of General Moses Cleveland of Connecticut, who had charge of the surveying of this region, acting as general agent for the Connecticut Land Company.]

It is the largest city of Ohio, and is situated on the south shore of Lake Erie, three hundred and fifty miles by rail east of Chicago. The city is built mainly upon a plain from sixty to one hundred and fifty feet above the lake, and five hundred and eighty feet above sea-level. It is divided into the East and West Sides by the tortuous valley of the Cuyahoga River, which is crossed by two high-level bridges—one mainly of stone, and one of iron, three thousand nine hundred and thirty-one feet long. The former, one thousand and seventy feet long, was completed in 1878 at a cost of two million two hundred thousand dollars. There are three other similar viaducts in different parts of the city.

The chief business street is now Euclid Ave., a really fine and wide thoroughfare, the west end of which is lined with substantial business blocks, such as the Perry-Payne Building. A little farther on the street expands into Monumental Park or the Public Square, containing a Soldiers' Monument and a statue of General Moses Cleveland. The new Federal Building, at the northeast corner of the square, contains the Post Office, the Custom House, and the Court House.

This building is the first of several public buildings comprised in the so-called "Group Plan," the others being the City Hall, County Building, Public Library, and Union Station. A broad mall connects all these buildings.

At the northwest corner is the Old Court House, adjoined by the American Trust Building. On the north side of the square, at the corner of Ontario Street, is the handsome building of the Society for Savings, established in 1849, and now having deposits of upwards of fifty million dollars. Adjacent is the Chamber of Commerce, containing a handsome auditorium, with a library and reading room. In Superior Avenue, beyond the Federal Building, is the massive City Hall, which is adjoined by the temporary building of the Public Library. A little to the north of this point is the huge Central Armory.

Euclid Avenue, which begins at the southeast angle of the Public Square, is, at its east end, also an important artery of business, and farther out becomes one of the most beautiful residence streets in America, with each of its handsome houses surrounded by pleasant grounds and shady trees. At the northeast corner of the Square and Euclid Avenue is the Williamson Building; a little farther on, also on the north side of the Avenue, is the handsome First National Bank; on the right is the tall, narrow building of the Guardian Savings & Trust Co. To the left is the Arcade, four hundred feet long, one hundred and eighty feet wide, and one hundred and forty-four feet high, with a fine five-balconied interior, running through to Superior Avenue; and to the right is the Colonial Arcade, running through to

Prospect Avenue. At the corner of East Sixth Street are the tall Garfield and New England Buildings. Nearly opposite the New England Building is the new Taylor Arcade, just east of which is the Hippodrome Building. Farther on, near east Ninth Street, is the Citizens Building, with the offices of the Citizens Savings & Trust Co., and at the corner is the Schofield Building. Directly opposite the latter, at the southeast corner of East Ninth Street and Euclid Avenue, is the Cleveland Trust Co. At the corner of East Twelfth Street is the handsome Union Club. Farther on are several fine churches. About four and one-half miles from the Public Square Euclid Avenue reaches University Circle, with a statue of Senator M. A. Hanna by Saint-Gaudens, and one of Kossuth, erected by the Hungarians of Cleveland. To the right is the building of the Western Reserve Historical Society, to the left is the Elysium, an artificial ice skating rink. Just beyond the Circle is the entrance to Wade Park, which contains statues of Commodore Perry, and a Goethe-Schiller Monument. Opposite the Park are the buildings of the Western Reserve University (including Adelbert College, Woman's College, Law, Medical, and Dental Schools, and a Library School, in addition to the graduate department) and the Case School of Applied Science. About one mile farther on the avenue passes Lake View Cemetery, containing the Garfield Memorial, the Rockefeller Monolith, the graves of Senator Hanna and John Hay, and the Wade Memorial Chapel.

Prospect Avenue, which runs parallel to Euclid Avenue on the south, is little inferior to it in beauty.

Cleveland's rapid growth is due mainly to the fact that nowhere else can the rich iron ores of Lake Superior, the coal of Northern Ohio, and the limestone of the Lake Erie islands, be brought together so cheaply; its position at the north terminus of the Ohio Canal being very advantageous, and seven railways terminate here.

The chief industries of the city are the various manufactures of iron, including steel rails, forgings, wire, bridges, steel and iron ships, engines, boilers, nails, screws, sewing machines, agricultural implements and machinery of all kinds, the refining of petroleum, wood-work, and other manufactures of endless variety. Cleveland is the greatest iron ore receiving point in America, one of the largest lumber markets and extensively engaged in the automobile industry.

Cleveland was founded in 1796 by General Moses Cleveland, under the direction of the Connecticut Land Company. In 1814 Cleveland was incorporated as a village with less than one hundred inhabitants. The opening of the Ohio land served as an impetus to growth, and in 1836 Cleveland was incorporated as a city. Its great prosperity dates from its connection by rail with the cities of the East and the manufacturing establishments set up during the Civil War.

Des Moines (*dē-moin'*), **Iowa.** [This name was applied by the Indians to a place in the form of Moingona, which the French shortened into Moin, calling the river "riviere des Moins." Finally, the name became associated with the Trappist monks, and the river by a spurious etymology was called "la rivière des moines," "the river of the monks."]

The capital and largest city of Iowa, it is an important manufacturing and commercial city, and noted especially for its extensive insurance interests and exceptional railroad facilities. It has many important buildings, among them the Capitol, built at a cost of three million dollars, the United States Government Building, the State Arsenal, a State Historical Building, completed in 1908 at a cost of five hundred thousand dollars, Drake University, Highland Park College, Des Moines College, and a state library. A new city hall at a cost of four hundred thousand dollars, and a great coliseum to seat ten thousand are recent additions.

The city has nearly one hundred churches of all denominations. Half a dozen bridges over the two rivers connect the different parts of the town, and there is a public park, with fine groves of forest trees.

Vast bituminous coal fields have contributed to the growth of the manufacturing industries. These include typewriters, wagons, sleighs, cotton and woolen goods, pottery, furniture, and electrical appliances. The city was one of the first to adopt the electric car system.

Des Moines was settled in 1846, incorporated as the town of Fort Des Moines, 1851, chartered as a city and became the capital of the State in 1857. In 1907 Des Moines adopted the commission form of government and attained wide celebrity as a leader in progressive municipal government.

Denver, Colo. [The "Queen City of the Plains"; named after James W. Denver, ex-Governor of Kansas, upon the consolidation in 1860 of the towns of St. Charles and Aurora.]

The capital of Colorado, it is situated on the South Platte River, nine hundred and twenty-two miles west of St. Louis. It lies on a level plain, five thousand one hundred and ninety-six feet above the sea, beyond which rise the snow-capped peaks and deep blue shoulders of the Rocky Mountains.

The Union Depot lies at the foot of Seventeenth Street, one of the chief business thoroughfares, and electric cars start from here for all parts of the city. Near the station is a large bronze Arch, bearing the work "Welcome." The route up Seventeenth Street and Seventeenth Avenue by electric car to the City Park and then across to Colfax (or Fifteenth) Avenue and return traverses the chief features of the city. On the way out is passed the Equitable Building, the roof of which affords a superb view.

The Rocky Mountains are seen to the west in an unbroken line of about one hundred and seventy miles, extending from beyond Long's Peak on the north to Pike's Peak on the south. Among the loftiest of the intervening summits are Grey's Peak, Torrey's Peak, and Mount Evans. The bird's-eye view of the city in the immediate foreground includes the State Capitol and the fine residences of Capitol Hill on the east.

At the corner of Seventeenth and Glenarm Streets is the Denver Club, and at the corner of Sherman Avenue are the University Club and the Central Presbyterian Church. In returning through Colfax (or Fifteenth) Avenue the following buildings may be observed: the State Capitol, an imposing structure erected at a cost of two million five hundred thousand dollars; the new Public Library, between Acoma and Bannock Streets; the United States Mint, at the corner of Cherokee street, and the West Side Court House. The County Court House occupies the block bounded by Court Place and Fifteenth, Sixteenth and Tremont Streets. The Custom House and Post Office, on Sixteenth Street, is another imposing building. In Fourteenth Street is a handsome Auditorium used by the Democratic Convention in 1908.

The other important buildings of the city include the Denver High School, Stout Street, between Nineteenth and Twentieth Streets; the City Hall, corner Fourteenth and Larimer Streets; the Mining Exchange; the Chamber of Commerce; Baptist College (Montclair); the Tabor Opera House Block; the Broadway Theater; the Denver Athletic Club; Trinity Church, Broadway and Eighteenth Street; the Church of Christ, Scientist, Fourteenth and Logan Avenues; the Y. M. C. A..

Lincoln and Sixteenth Avenues; Mystic Shrine Temple, Sherman and Eighteenth Avenues; the Westminster University of Colorado, and the Jesuit College of the Sacred Heart (College Avenue, corner of Homer Avenue). On Capitol Hill are the new buildings of St. Mary's Cathedral (Roman Catholic) and St. John's Cathedral (Episcopalian). The Art Museum, in Montclair, contains a collection of paintings and other objects of art. The Museum in the City Park includes an interesting collection of Colorado animals. In University Park, eight miles to the southeast of the Union Depot, is the University of Denver.

The city is the center of a great agricultural and mining district, and has a large trade in cattle, hides, wool, and tallow. It is chiefly, however, to its position as the center of a great mining region that Denver owes its marvelous progress; the discovery, in 1878, of the fabulous wealth of the Leadville Hills attracted capital and emigration from all parts of the continent. It has a United States assaying mint, is an important ore market, and is noted for its smelting and refining works, foundry and machine shops.

Denver has an abundant water supply, and the clear invigorating air and dry climate of Denver are famous. It was founded on a barren waste, dry and treeless, in 1858, and the following year incorporated as a city by the Provisional Legislature.

Detroit (*dē-troit'*), **Mich.** [The "City of the Straits"; named from the river or strait on which the city is built. Derived from two French words, *detroit*, "the narrows."]

It is situated on the Detroit River, eighteen miles from Lake Erie, at an altitude of six hundred feet. The river, sometimes called the "Dardanelles of the New World," is here the boundary between the United States and Canada. It affords a splendid harbor, with a water-front of about nine miles. Ferries connect with the Canadian side. Many beautiful islands, with those of Lake St. Clair, are popular as places of summer residence and resort.

One of these, Belle Isle, is about seven hundred acres in extent and forms a beautiful public park, with fine trees, and still retaining many of its natural features unimpaired. It contains a statute of Schiller, a small zoological collection, a large aquarium and horticultural building, and a casino.

Woodward Avenue, the principal thoroughfare, divides the city into two very nearly equal parts. It is also the main business street, and at its northern end has many of the city's most prominent buildings. Its expansion, about half a mile from the river, is known as the Campus Martius, adorned with a handsome fountain, from which Michigan and Gratiot Avenues diverge to the left and right. To the left stands the City Hall, the tower of which contains a clock with a dial eight and one-half feet in diameter. In front of the City Hall is the Soldiers' Monument.

In Gratiot Avenue, near the Campus Martius, is the Public Library, containing two hundred and twenty thousand volumes and some historical relics. The Chamber of Commerce, at the corner of Griswold and State Streets, is thirteen stories high. The Post Office, in Fort Street, adjoining the site of the old Fort Lernoult, is a handsome building. In the same street, at the southeast corner of Shelby Street, is the State Savings Bank, and adjoining it on the east is the tall Penobscot Building.

Just to the east of the Campus Martius, in Cadillac Square, stands the County Building. It is in a plain renaissance style with a Corinthian portico over the main entrance, sculptures in the pediment, and a tower surrounded by a gilded dome. In front of it is the Cadillac Chair, erected in 1901 to commemorate the two hundredth anniversary of the city's foundation.

A little farther on Woodward Avenue reaches Grand Circus Park, a square with trees, fountains, and a statue of ex-Governor Pingree. To the north, at the corner of Adams Street, is the Central Methodist Church, with a richly decorated interior. One block to the east, between Adams and Elizabeth Streets, is the new building of the Y. M. C. A. At the corner of Edmund Place, one-half mile farther on, are the First Unitarian and First Presbyterian churches, two fine Romanesque buildings of red stone. Between Erskine and Eliot Streets, to the right, is the Temple Bethel, an effective Jewish synagogue. Also to the right, at the head of Martin Place, is the handsome Harper Hospital; and Grace Hospital is also seen to the right (corner of Willis Avenue and John R. Street) a little farther on. To the left, a little higher up, is the Detroit Athletic Club. The north end of Woodward Avenue and the adjoining streets form the principal residence quarter.

Jefferson Avenue, which runs at right angles to Woodward Avenue, crossing it one-fifth mile from the river, contains many of the chief wholesale houses, and toward its northeast end has also many pleasant residences. The site of Fort Pontchartrain was at the corner of Jefferson Avenue and Griswold Street, two squares to the west of Woodward Avenue. To the east, on the left side of the street, are the Roman Catholic Cathedral of Saints Peter and Paul and the Jesuit College, and on the right side the Academy of the Sacred Heart. On the same side, at the corner of Jefferson Avenue and Hastings Street, about one-half mile to the east of Woodward Avenue, stands the Museum of Art, containing paintings, sculptures and oriental curiosities.

The commerce of Detroit is enormous, a number of conditions favoring it as a commercial and industrial center. Its geographical position brings it into relation with an immense lake traffic and with the Canadian trade. About three-fourths of the total trade is with Canada. The principal exports are grain, wool, pork, lard, hides, and copper. It is the greatest automobile emporium in the United States.

The manufactures include stoves, freight cars, drugs, varnish, paint, furniture, carriages, cigars, and matches. Other industries are those of iron and steel, foundry and machine shop products. lumber and tanning.

The site of Detroit was visited by a party of Frenchmen as early as 1610, and again by La Salle in 1670, but no permanent settlement was made until 1701, when Sieur de la Mothe Cadillac, the first Governor of the French territory in this vicinity, built Fort Pontchartrain and established a small trading village. In 1815 Detroit was incorporated as a village, and in 1824 was chartered as a city by the Legislature of Michigan Territory. It was the capital of the Territory from 1805 to 1837, and of the State from 1837 to 1847.

Hartford, Conn. [Named from Hertford, England.]

It is the capital of Connecticut, on the right bank of the Connecticut River, fifty miles from its mouth, and one hundred and twelve by rail northeast of New York. It is a handsome city, finely situated on the navigable Connecticut River, at its confluence with the Park River. The Union Depot is near the center of the town. To the southwest of it, beyond the Park River, lies Bushnell Park, containing the handsome white marble Capitol, a conspicuous object in most views of the town.

The fine sculptural embellishment of the north facade of the Capitol was done under the supervision of Paul W. Bartlett and partly by his own hand. The Senate Chamber contains a good

portrait of Washington, by Stuart, and an elaborately carved chair, made from the wood of the "Charter Oak." In the Library are the Charter of Connecticut and portraits of Connecticut governors. In the east wing of the ground floor is a statue of Nathan Hale, and in the west wing are the tombstone of General Putnam and a statue of Governor Buckingham.

The gateway to the park was erected as a Soldiers' Memorial.

Following Capitol Avenue to the east and then turning to the left, along Main Street, is the Wadsworth Athenæum, containing a gallery and libraries with one hundred and fifty thousand volumes, and the collections of the Historical Society. Adjacent are the buildings of the Ætna Life Insurance, the Ætna Fire Insurance, and the Travelers Insurance Co. A little farther on is the Post Office, adjoined by the interesting Old State House, erected by Chas. Bulfinch. Opposite is the Connecticut Mutual Life Insurance Co. The State Arsenal is also on Main Street farther along.

Near the State House are the High School, the Hartford Orphan Asylum, and the Hartford Theological Institute. About a mile to the south is Trinity College, with fine buildings and equally fine location. The Colt Firearms factory is in the southeast part of the city, and near it is the handsome Church of the Good Shepherd, erected in memory of Colonel Colt, inventor of the revolver, by his wife.

A tablet at the corner of Charter Oak Place marks the site of the "Charter Oak," where, in 1687, the charter of Connecticut was concealed to save it from Sir Edmund Andros, a tyrannical British governor. Charter Oak Park is famous for its trotting races. Elizabeth Park has a fine show of flowers.

Among other large buildings are the Retreat for the Insane, the Deaf and Dumb Asylum, the Old Folks Home, the City Hospital, and St. Joseph's Roman Catholic Cathedral. The last is in Farmington Avenue, which, with its continuation, Asylum Street, contains many fine private residences.

Hartford is a prominent commercial and manufacturing city, and is particularly noted for the importance of its insurance companies, rating third in this regard among the cities of the United States. It is the farthest point, at present, to which large steamers can ascend the Connecticut River. Among the manufactures are firearms—the celebrated Colt manufactory is here—typewriters, rubber goods, especially tires, electrical supplies, automobiles, bicycles, sewing-machines, hardware, tools, carriages, silver plate, woven wire mattresses, book binding machinery, cash registers, knit goods, etc.

The site of a Dutch fort in 1633, and of a colony of Massachusetts settlers as early as 1635-1636, Hartford was incorporated as a city in 1784. Here (January 14, 1639) was adopted the first constitution in writing ever proclaimed by a people organizing a government, therefore Hartford is called the birthplace of American democracy. In 1687 occurred the famous attempt of Governor Andros to seize the charter of Connecticut. Hartford was the capital of Connecticut until 1701, thenceforth until 1873 it divided the responsibility with New Haven. Since 1875 it has been sole capital. Here in 1814 took place the famous meeting of New England delegates known as the Hartford Convention.

About 1780 the "Hartford wits," of whom Joel Barlow was one, made the city a literary center. Since that time it has been the residence of a large number of literary men and women; among them Harriet Beecher Stowe, Whittier, Trumbull, Charles Dudley Warner, and Samuel L. Clemens. Noah Webster, Henry Barnard, Frederick Law Olmsted, and John Fiske were born here.

Indianapolis (*in-di-a-nap'o-lis*), **Ind.** [Literally, the City of Indiana, from *Indiana* and *polis*, city.]

It is the capital of Indiana, on the west fork of White River, in a level plain one hundred and ninety-five miles southeast of Chicago by rail. It is a regularly built and beautiful city.

The focus of the city is the circular Monument Place, from which four wide avenues run diagonally to the four corners of the city. The other streets, many of them one hundred feet wide, are laid out at right angles to each other. In the center of this place rises the Soldiers and Sailors' Monument, two hundred and eighty-five feet high, by Bruno Schmitz of Berlin. Round the monument are statues of General G. R. Clark, Governor Whitcomb, President W. H. Harrison, and Governor Morton. A little to the west is the State Capitol, a large building with a central tower and dome, erected at a cost of two million dollars. At the east entrance to the Capitol is a statue of Governor Morton and near by is that of Governor Hendricks. The Marion County Court House, also an imposing edifice, lies to the east of Monument Place, while to the north of it is the United States Court House and Post Office, erected in 1902-1904. To the southwest of the former is a statue of General H. W. Lawton, by A. O'Connor. In University Park is a statue of Benjamin Harrison, erected in 1908.

The John Herron Art Institute, at the corner of Pennsylvania Avenue and Sixteenth Street, contains a School of Art and a collection of modern paintings. Other large and important buildings are the Blind Asylum; the Propylæum, owned and controlled by a stock company of women for literary purposes; the Deaf and Dumb Asylum; the Union Railway Station; the City Hall; the Public Library; the Masonic Temple; the Oddfellows Building; the Deutsche Haus, a German club-house; the Mænnerchor Building, and several churches. The Winona Technical Institute is installed in buildings erected for the United States Arsenal. The Central Hospital for the Insane lies one and one-half miles to the west of the city, beyond the White River. The Riverside, Broad Ripple, Brookside, Fairview, and Garfield Parks deserve mention.

Indianapolis is one of the chief railroad centers of the United States, fifteen main lines converging here. It is also a great center of electric railways, which radiate hence in all directions, two hundred and fifty cars leaving the terminal station daily. The trade in agricultural produce is very considerable. Pork-packing is the leading industry, but there are also large flour and cotton and woolen mills, numerous foundries, and manufactories of furniture, carriages, tiles, etc.

Indianapolis was first settled in 1819, the city founded in 1821, became the seat of the state government in 1825, was incorporated as a town in 1836, and received its city charter in 1847. In the same year the first railroad in the state was opened.

Los Angeles (*los an'je-les*, Sp. pron. *lōs äng'he-lās*), **Cal.** [Named by the Spaniards Pueblo de la Reina de los Angeles, "The Town of the Queen of the Angels," hence Los Angeles, "the angels."]

It is the metropolis of southern California, lies on the Los Angeles River, twenty miles above its mouth and fifteen miles in a direct line from the Pacific Ocean, and four hundred and eighty-three miles southeast of San Francisco by the Southern Pacific Railroad.

It is a splendid city of wide streets and spacious sidewalks, with an extensive residential quarter, one hundred and thirty churches, over sixty public schools, and about one thousand seven hundred manufactories. It publishes newspapers in seven languages

The city, especially the residential quarters, is embowered in plants, among the characteristic

features of which are the swift-growing eucalyptus, the graceful pepper-tree, many palms, Norfolk Island pines, live-oaks, india-rubber trees, orange trees, roses, geraniums, yuccas, century plants, bananas, calla lilies, and pomegranates. A distinguished French traveler pronounces Los Angeles one of the few really beautiful cities in the United States.

Broadway, running parallel to Main Street, is the dividing line for east and west, as First Street is for north and south. Among the many substantial buildings in Main Street are the City Hall, between Second and Third Streets, and the new Chamber of Commerce. The latter contains an interesting collection of California products, the Palmer collection of Indian antiquities, and the Coronel collection, illustrating the Spanish period. Here is also the first cannon brought to California by Padre Junipero Serra in 1769. In Temple Street, near Broadway, stands the County Court House. The Public Library is at the southeast corner of Broadway and Third Street.

Other edifices worthy of mention are the Woman's Club, in the Mission-Renaissance style (940 South Figueroa Street), the State Normal School (corner Grand Avenue and Fifth Street), the Security Savings Bank (corner Spring and Fifth Streets), the Union Trust and Hellman Buildings (opposite corners of Spring and Fourth Streets), the Auditorium (corner Fifth and Olive Streets), the Y. M. C. A. (Hope Street, between Seventh and Eighth Streets), the Y. W. C. A. (corner Hill and Third Streets), the Farmers and Merchants National Bank (corner Fourth and Main Streets), the Grant Building (corner Broadway and Fourth Street), Hamburger's (corner Broadway and Eighth Street), Merchants Trust (207 Broadway), and the International Bank (corner Temple, Spring and Main Streets). The viaduct of the Electric Railway, in San Fernando Street, spanning the railway tracks on the east side of the city, is an interesting piece of engineering.

Los Angeles also contains many parks, including the Griffith Park of three thousand acres, and the Eastlake Park and Westlake Park, each with a small lake. The University of Southern California is situated at Wesley Avenue and Thirty-fifth Street.

The small plaza, with the Old Mission Church, at the north end of the business-town, is interesting as a survival of the ancient settlement. Just beyond is a genuine Chinatown, keeping many of the original adobe structures. An excellent view of the city can be obtained from the tower at "Angel's Flight," corner Hill and Third Streets. Opposite Eastlake Park is an Ostrich Farm, with some two hundred adult birds.

Los Angeles is the center of the orange-growing industry. The residents are principally occupied in the cultivation and export of oranges, grapes, and other fruits, as well as the manufacture of wine. There are rich oil-wells in and near the city and this district now forms part of one of the richest petroleum fields in the world. Many invalids resort to Los Angeles in the winter because of its mild and equable climate. The city has a harbor on the coast, eighteen miles off.

It is one of the oldest towns in the Western states, and was already a thriving place when the Franciscan fathers established a mission there in 1781. Under Mexican rule Los Angeles alternated with Monterey as the capital of California. From 1835 to 1847 it was the capital of the State of California. In 1846 it was occupied by the United States forces. For the first century of its history Los Angeles was only a small pueblo constructed mainly of adobe in the Mexican style, but the advent of the railroad brought a sudden impetus. It was the first city in the United States to be lighted with electricity.

Louisville (*lōō'ĭ-vĭl*, or *lōō'ĭs-vĭl*), **Ky.** [The "Falls City"; named by act of the Virginian Legislature in 1780, in honor of Louis XVI. of France, then assisting the American colonies in their revolutionary struggle.]

It is the largest city of Kentucky, and is situated on the Ohio River, one hundred and thirty miles by water southwest of Cincinnati. The river is here crossed by two railroad bridges, and forms a series of rapids—the "Falls of Ohio"—descending twenty-six feet in two miles.

Louisville covers about forty square miles of a plain, and is nearly enclosed by hills. It is handsomely built and extends for nearly eight miles along the river. Its well-shaded streets are from sixty to one hundred and twenty feet wide, and slope up from the river.

Perhaps the most prominent building in Louisville is the Custom House, in Chestnut Street between Third and Fourth Streets. The Court House is in Jefferson Street between Fifth and Sixth Streets, and is adjoined by the City Hall, with its square clock-tower.

The Louisville Public Library, at the corner of Fourth and York Streets, contains also an art gallery and a small museum, including the Troost Collection of Minerals.

The Farmers' Tobacco Warehouse, in Main Street, is the center of the tobacco trade and has a large storage capacity. The University of Louisville, at corner of Eighth and Chestnut Streets, is housed in a handsome building. The Lincoln Bank, corner of Fourth and Market Streets, is fifteen stories high, with a splendid view from upper windows and roof.

Fourth Avenue, with many pleasant residences, leads south, passing the pretty little Central Park, to the Racecourse. Louisville possesses three fine parks: Iroquois Park, Cherokee Park, and Shawnee Park, to the south, east and west of the city. The First Regiment Armory has an enormous drill-hall and can seat fifteen thousand persons.

The Louisville Bridge, one mile long, crossing to the west end of Jeffersonville, was built in 1868-1872 and has twenty-seven iron spans supported by limestone piers. The Kentucky and Indiana Bridge, leading to New Albany, is one-half mile long. A third bridge, also leading to Jeffersonville, was constructed in 1892.

President Zachary Taylor (1784-1850) is buried near his old home, five miles to the east of Louisville.

Louisville is the greatest market for tobacco in the world, and has large pork-packing establishments, distilleries, and tanneries, with manufactories of plows, furniture, castings, gas and water pipes, machinery, flour, cement, cotton seed oil and cake, steam railroad cars, and carriages and wagons.

It was founded in 1778 and in 1780 named in honor of Louis XVI. of France, whose troops were then assisting the Americans. A great part of the town, including the tobacco-market and the city hall, was destroyed by a cyclone in March, 1890. Since the Civil War, Louisville has rapidly grown in importance as one of the chief gateways to the southwest.

Milwaukee (*mĭl-wau'kē*), **Wis.** [Named from the river, called by the Algonquins Minnwaukee, or Me-ne-wau-kee, "good earth, good country, rich or beautiful country."]

It is the largest city in Wisconsin, and is situated on the west shore of Lake Michigan at the common mouth of three improved and navigable rivers, which, with a canal, supply twenty-four miles of dockage. An excellent harbor has been formed by the erection of huge breakwaters, and the river admits the largest lake-vessels to the doors of the warehouses.

The city is well built, largely of a light-colored

brick, and many of its streets are lined with beautiful shade trees, recalling some of the older eastern cities. Among the finest residence streets are Grand Avenue, Prospect Avenue, Waverly Place, Juneau Avenue, Marshall Street and Astor Street. About two-thirds of the inhabitants are Germans, which may account for its successful cultivation of music and art. There are no fewer than seventy-five musical societies in the city.

Grand Avenue, which runs east and west, contains many of the chief buildings and best shops, while Wisconsin Street and East Water Street are also busy thoroughfares. Among the most prominent buildings is the Federal Building, a handsome structure of granite in a turreted baronial style, occupying the block bounded by Jefferson, Jackson, Michigan and Wisconsin Streets, and containing the Post Office, Custom House and United States Court House. The interior is finely finished in marbles, mosaics, mahogany, and oak. The County Court House, a brown sandstone edifice, is in the square bounded by Jefferson, Jackson, Oneida, and Biddle Streets. The tall Wells Building, at the corner of Milwaukee and Wisconsin Streets; the Chamber of Commerce, Michigan Street; Plymouth Church, a massive building at the corner of Van Buren and Oneida Streets, and St. Paul's Church, Marshall Street, are other important structures. The Auditorium, in Cedar Street, can accommodate ten thousand people.

The Layton Art Gallery, a well-lighted structure at the corner of Jefferson and Mason Streets, has some interesting pictures and statues. The paintings include examples of Rosa Bonheur, Constable, Corot, Millet, Achenbach, Alma-Tadema, Clays, Inness, Kensett, Mauve, Holmberg, Pradilla, Mesdag, Munkácsy, Van Marcke, and other modern masters. In the Sculpture Hall are works by Hiram Powers and Romanelli. The magnificent Public Library in Grand Avenue, between Eighth and Ninth Streets, contains two hundred thousand volumes and a free museum of natural history, palæontology, etc.

The curiously thin looking City Hall, with one of the largest bells in the world and an illuminated clock-dial, visible for two miles at night, occupies a triangular site bounded by East Water, Market and Biddle Streets.

Other notable structures in the business district are the Germania Building, the Evening Wisconsin Building, the Sentinel, the New Insurance Building, the Mitchell Building and the Pabst Building.

Among the public monuments are statues of Washington, near Ninth Street, and the Soldiers' Monument.

Juneau Park, laid out on a bluff overlooking Lake Michigan, contains statues of Solomon Juneau, the earliest white settler, and Leif Ericson; it commands fine views. Lake Park, farther to the north, also overlooks the lake. Near it is the North Point Pumping Station, with a tall and graceful water tower. The Forest Home Cemetery, at the southwest corner of the city, deserves notice. The attractions of Washington Park, on the west limits of the city, include a large herd of deer.

The great breweries, such as Pabst's, which covers thirty-four acres, or Schlitz's, are wonderfully interesting plants, while the grain elevators, the flour mills, the coal docks, the International Harvester Co., and the workshops of the C. M. & St. P. Railway are also great concerns. To the south are the rolling mills of the Illinois Steel Co., covering one hundred and fifty-four acres of ground. To the southwest, chiefly in the valley of the Menomonee, are the large brick yards that produce the light colored bricks which give Milwaukee the name of "Cream City." To the north, along the Milwaukee River, are extensive cement works.

Sheridan Drive, skirting the lake to the south for two miles, is intended to be prolonged so as ultimately to meet the boulevard of that name running from Chicago to Fort Sheridan.

The other industries include manufactories of leather, machinery, iron and steel goods, tobacco, clothing, stoves, tinware, brick, furnaces, cars, steel and malleable iron. Pork packing is also carried on extensively.

Milwaukee became a village in 1835 and received a city charter in 1846. Its growth has been rapid, particularly in the last twenty-five years.

Minneapolis (*min-e-ap'ō-lis*), **Minn.** [The "Flour City"; named from Dakota Indian words, *Minni*, "water," *ha*, "curling," and the Greek word *polis*, "a city," namely "city of the curling water," alluding to the Falls of St. Anthony.]

It is the largest city of Minnesota, adjoins the capital, St. Paul, and is situated on both sides of the Mississippi, which is here crossed by numerous bridges. The Falls of St. Anthony, with a perpendicular descent of sixteen feet, afford a water power which has been a chief source of the city's prosperity.

At the corner of Second Avenue South and Third Street stands the Metropolitan Life Building, erected at a cost of one million six hundred thousand dollars. Adjacent is the Post Office, in a Romanesque style.

On Hennepin Avenue, at the corner of North Fifth Street, is the imposing Lumber Exchange. To the right are the West Hotel and the Masonic Temple. At the corner of Eighth Street is the private art gallery of Mr. T. B. Walker, containing good specimens of British portrait painters and of the Barbison school and also works by or ascribed to Raphael, Michael Angelo, Rubens, Rembrandt, Van Dyck, Holbein, and Murillo.

Farther on, at the corner of Tenth Street, is the Public Library and Art Gallery, an ornate Romanesque structure.

At the corner of Sixteenth Street is the new Roman Catholic Cathedral.

Other prominent churches are the First Unitarian Church, at the corner of Mary's Place and Eighth Street; the Westminster Presbyterian Church, Nicollet Avenue; the Church of the Redeemer; the Fowler Methodist Episcopal Church, on Lowry Hill; the Second Church of Christ, Scientist; Plymouth Church, and St. Mark's Cathedral.

At the other end of Hennepin Avenue is the Union Depot. Among other prominent buildings in the business quarter are the Court House and City Hall, a handsome building in Fourth Street, completed at a cost of three million dollars, with a tower three hundred and forty-five feet high; the New York Life Insurance Building, Fifth Street and Second Avenue, with an elaborate interior; the Northwestern National Bank; the First National Bank; the Andrus Building; Donaldson's Glass Block Store; the Security Bank Building, and the Chamber of Commerce, Fourth Street South and Fourth Avenue.

The University of Minnesota lies on the left bank of the river, between Washington and University Avenues, and occupies various well-equipped buildings.

Other notable institutions are the Augsburg Theological School, Minneapolis Normal School, and a Conservatory of Music.

Within the urban limits of Minneapolis are fourteen wooded lakes, while the gorges of the Mississippi and the Minnehaha Creek are very picturesque. These natural features have been made the basis of a fine system of boulevards. From the southeast side of Lake Harriet the road runs to the east along the Minnehaha Creek, passing Lake Amelia, to Minnehaha Park, containing the graceful Falls of the Minnehaha, fifty feet high and immortalized by Longfellow.

The most delightful resort near Minneapolis or St. Paul is Lake Minnetonka (eight hundred and twenty feet above the sea), which lies fifteen miles to the west. The lake is singularly irregular in outline, and with a total length of twelve to fifteen miles has a shore line of perhaps one hundred and fifty miles.

Minneapolis is the foremost city in the world in flour and lumber products. The flour mills, perhaps its most characteristic sight, are congregated on the banks of the Mississippi, near St. Anthony's Falls. Other important industries are the manufacture of agricultural implements and machinery, bread and baking products, cars and general shop construction, food preparations, foundry products, furniture, fur goods, dressed fur, malt liquors, patent medicines, and printing and publishing.

The Falls of St. Anthony were named in 1680 by Father Hennepin. In 1819 Fort Snelling was built by the United States government. Though a large mill was built as early as 1822, it was not till 1850 that a permanent settlement was made. In 1856 Minneapolis was incorporated as a town on the west bank of the river, and in 1867 it was incorporated as a city. St. Anthony on the east bank was annexed in 1872.

Nashville, Tenn. [The "Rock City"; first named as a settlement, Nashborough, in honor of Francis Nash of North Carolina, a brigadier-general in the Continental Army. In June, 1784, changed to Nashville.]

It is the capital of Tennessee, on the navigable Cumberland River, two hundred miles above the Ohio, and one hundred and eighty-five miles by railroad southwest of Louisville. The city, which is one of the principal railroad centers in the Southern states, is built mainly on the left bank of the river, which is crossed by a suspension bridge and a railroad drawbridge to the suburb of Edgefield. Nashville is a handsome, well-built town, and it is, perhaps, the most important educational center in the South.

The most prominent building in the city is the State Capitol, conspicuously situated on a hill. In its grounds are a bronze equestrian statue of Andrew Jackson, and the tomb of President Polk, whose home stood at the corner of Vine and Union Streets. Among the other chief buildings are the Court House, the Custom House, the Parthenon, used for exhibitions of art, Greek plays by students, etc., the Vendome and Bijou Theaters, the Carnegie Library, the Board of Trade, the First National Bank, and the Stahlman Building.

At the head of the educational institutions stands Vanderbilt University, endowed by Cornelius Vanderbilt with one million dollars. In the campus is a colossal statue of the founder, by Moretti. Other well-known institutions are the Peabody Teachers' College, Boscobel College, Belmont College, the Saint Cecilia Academy, Radnor College, Buford College and Ward's Seminary.

There are also several large colleges for colored students.

Among the places of interest near Nashville are the Hermitage, the home of General Andrew Jackson, eleven miles to the east.

Nashville occupies a foremost place among the manufacturing centers of the country. It is the fifth boot and shoe market in the United States, the largest candy and cracker manufacturing city in the South, and does an enormous wholesale dry goods, grocery, and drug business. It carries on an extensive trade in cotton and tobacco; while its manufactures, which are rapidly extending, include cotton, flour, oil, paper, furniture, timber, leather, iron, and spirits. The iron interests of the South are largely controlled here.

Nashville was settled in 1780, received its charter in 1806, and in 1843 was made the permanent capital.

New Haven, Conn. [The "City of Elms"; named by the original settlers the "new haven." The original Indian name was Quinnipac. The present name substituted "by the court" September 5, 1640.]

It is the chief city and seaport of Connecticut, at the head of New Haven Bay, is situated four miles from Long Island Sound, seventy-three miles by railroad northeast of New York and thirty-five miles southwest of Hartford.

The city is situated on a level plain, with a background of hills. Its broad streets are shaded with elms, and the public squares, parks, and gardens, with its handsome public and private edifices, make it one of the most beautiful of American cities.

From the large Union Station, which adjoins the harbor, Meadow Street leads north to the Public Green, on which are the City Hall, three churches, the Second National Bank, and the Free Public Library, United States Court House and Post Office. At the southeast corner of the Green is the Bennett Fountain, designed by John F. Weir after the monument of Lysicrates at Athens.

In College Street are most of the substantial buildings of Yale University, which, besides the Academic Department, has schools of Science, Theology, Medicine, Law, Forestry, Music, and Fine Arts, and also a Graduate School.

From the Public Green the university "campus" or quadrangle is entered by an imposing tower-gateway known as Phelps Hall. Among the buildings in the campus are the Art School, containing a good collection of Italian, American, and other paintings and sculptures; Connecticut Hall, the oldest Yale building (1750); Osborn Hall; Battell Chapel; Vanderbilt Hall; Alumni Hall; Dwight Hall, and the College Library. At the corner of Elm and High Streets is the Peabody Museum of Natural History, in which the mineralogical collections are especially fine.

Other important buildings of the university are the buildings of the Sheffield Scientific School, the Schools of Law, Medicine, and Divinity, the Chemical and Physical Laboratories, Memorial and other large halls.

Hillhouse Avenue is especially noted for its trees, and Chapel Street, the principal promenade, for the gardens surrounding many of the residences.

The parks have an aggregate area of one thousand two hundred acres. Besides the Green are the parks at East Rock (three hundred and sixty feet high) and West Rock (four hundred feet high), two masses of trap rock near the city which afford fine views. East Rock is surmounted by a soldiers' monument. West Rock is famous for a cave in which the regicides Goffe and Whalley were for a time concealed. Savin Rock, Morris Cove, and Momaugin are shore resorts accessible from the city by electric car lines.

The railway lines from New Haven to New York City are the only ones of consequence that have been completely electrified.

New Haven is an important industrial city and has considerable commerce. The harbor has a jetty and a breakwater surmounted by a lighthouse, and the port has a large coasting trade. But it is of more consequence as a manufacturing town, employing many thousands of workers producing hardware, wire, locks, clocks, cutlery, firearms, corsets, india-rubber goods, carriages, furniture, paper, matches, musical instruments, etc.

New Haven was settled in 1638 by a company chiefly from London. In 1639 a government was established under a written constitution, and Theophilus Eaton, the pastor of the colony, was chosen and continued in the governorship until

1658. Church membership was a qualification for suffrage and eligibility to office. The New Haven colony was founded in 1643 by the union of Milford, Guilford and Stamford with New Haven. In the same year it became a member of the confederacy of the United Colonies of New England. The charter of Charles II. for Connecticut (1662) included the New Haven colony, but the latter, supported by Massachusetts and Plymouth, stubbornly opposed absorption and was only forced to accede in 1664. Yale College, founded in Saybrook, was removed to New Haven in 1717. The town was captured by the British under Tryon and Garth, July 5, 1779. It was incorporated as a city in 1784. Joint capital with Hartford from 1701; the government was removed from New Haven altogether in 1873.

New Orleans (*nū ôr'lē-ănz*), **La.** [The "Crescent City"; its name is a translation of the French name *Nouvelle Orleans*, given by them in honor of the Duc d'Orleans, then Regent of France.]

It is the chief city of Louisiana, a great port and mart, and is situated on both sides of the Mississippi River—the greater portion on the east bank—one hundred and seven miles from its mouth, and one thousand one hundred and ninety miles southwest of New York. The Mississippi makes two bends here, whence the city was called "The Crescent City," but it is now shaped like the letter S. The river is from six hundred to one thousand yards wide, and sixty to two hundred and forty feet deep. The bar at its mouth was removed in 1874-1879 by the Eads jetties in South Pass, and vessels of thirty feet now easily reach New Orleans.

A great part of the city is below the level of the river during the high flood tides, which last for a few days each year, and is protected by a levee or embankment, fifteen feet wide and fourteen feet high. The city is laid out with considerable regularity, and many of the chief streets are wide and shaded with trees. The most important business thoroughfare is Canal Street, which runs at right angles to the river and divides the French Quarter, or "Vieux Carré" on the northeast, from the New City, or American Quarter, on the southwest. The finest residences are in St. Charles Avenue, and in Esplanada Avenue, where the wealthy Creoles have their homes. Of the total population about one-quarter are negroes, while the remaining three-fourths include large proportions of French, German, Irish, Italian and Spanish blood.

While it possesses few imposing buildings, New Orleans is a picturesque city. There are several parks, little improved, but with handsome monuments or statues of Jackson, Lee, Franklin, and others. The custom house of granite cost four million five hundred thousand dollars, and is the largest and most imposing building in the city. It is a large granite building in Canal Street, near the river, and contains a large Marble Hall.

Just below the Custom House, Canal Street ends at the Levee, which extends along the west bank of the Mississippi for about six miles and presents a very animated and interesting scene. At the left is Jackson Square, the old Place d'Armes, which retains its ancient iron railing, and contains a statue of General Andrew Jackson, by Mills. It is adjoined by the Cathedral of St. Louis, a good specimen of the Spanish-Creole style, built in 1792-1794, on the site of the first church in Louisiana, but altered in 1850. It contains some paintings and interesting tombs.

The buildings to the right and left are Court Houses, that to the south having been built for the Cabildo, or City Council of the Spanish régime. In it and in front of it were held the ceremonies attending the cession of Louisiana by the French Government to the United States in 1803.

In Orleans Street, near the east end of the Cathedral, is a Convent of Colored Nuns, which contains what was formerly the famous Quadroon Ballroom, mentioned by Cable, the scene of many celebrated festivities.

On the Levee, just beyond Jackson Square, is the French Market, which often reveals a scene of the greatest picturesqueness and animation. A little farther on, at the foot of Esplanade Avenue, is the United States Branch Mint, a large building in the Ionic style. In Royal Street, four blocks from Canal Street, is the new Court House, a handsome structure of white marble and terra cotta.

In the fine French Quarter the chief promenades are Esplanade Avenue, Rampart Street and Bourbon, Toulouse, Conti and Royal Streets. At the corner of Chartres and Hospital Streets is the Archbishop's Residence, in the unchanged Ursuline Convent, built in 1730.

Following St. Charles Avenue from Canal Street to the south, is the St. Charles Hotel and the Orpheum and, just beyond, Lafayette Square, around which are grouped the City Hall, the new Post Office, St. Patrick's Church, the First Presbyterian Church, and the Odd Fellows' Hall. In the square are a statue of Franklin, by Hiram Powers, a monument to John McDonough, and a statue of Henry Clay. Farther on is Lee Circle, with a monument to General Robert E. Lee. At the corner of Camp Street and Howard Avenue, adjoining Lee Circle, stands the Howard Library, the last work of H. H. Richardson, who was a native of Louisiana. Adjacent are Memorial Hall, a museum of Confederate relics, and the new building of the Public Library. To the southwest, in Carondelet Street, is the Jewish Temple Sinai. The monument to Margaret Haughery, the "Orphans' Friend," is said to have been the first statue of a woman erected in the United States.

Tulane Avenue, named in honor of the chief benefactor of Tulane University, and its continuation Common Street, contain the Law Department of Tulane University, the House of Detention, the Jesuit Church of the Immaculate Conception in a singular Moorish style, the Parish Prison and Criminal Courts, the Hôtel Dieu, and the large Charity Hospital, originally established in 1784. The large Cotton Exchange is at the corner of Carondelet and Gravier Streets; the Produce Exchange is in Magazine Street, and the Sugar Exchange is at the foot of Bienville Street. The United States Marine Hospital lies near the river.

St. Charles Avenue, extending in a crescent from Lee Circle past Audubon Park to the river, is lined with oaks and magnolias and contains many old and admirable private residences. Among its public buildings are Christ Church, the New Orleans University, the Academy of the Sacred Heart, the Jewish Orphan Home, and the Harmony Club. At the point where the avenue crosses Audubon Park are the newer buildings of the Tulane University, an important and well-equipped institution. A department of Tulane University is the H. Sophie Newcomb Memorial College for Women, founded in 1886. A legacy of John McDonough has built and equipped thirty handsome school houses in different parts of the city.

The City Park, on the Metairie Ridge, is one hundred and fifty acres in extent. The Audubon Park, in which the Great Exhibition of 1884-1885 was held, and which now holds the "Sugar Experimental Station" of the State of Louisiana, is a long segment extending back from the river, being the ground in which the sugar cane was first grown in this state. Both parks contain fine live-oaks.

New Orleans is the largest cotton market in the world except Liverpool, handling annually two

million bales. The manufacturing products include machinery, cotton goods, boots and shoes, and amount in a year to sixty million dollars. As the outlet of the Mississippi Valley it commands a large export trade.

The site of New Orleans was first visited in 1699 by Bienville, who in 1718 laid the foundations of the city, and in 1726 made it the capital. In 1763 it was ceded to Spain by France, with the rest of Louisiana; but when in 1765 the Spanish governor attempted to take possession, he was driven out, and the people established a government of their own till 1769, when the Spaniards occupied it. It was ceded to France in 1802, and transferred to the United States a few days later. Incorporated as a city in 1804, it was divided in 1836-1852 into three separate municipalities, in consequence of the jealousies between the Creoles and the Americans. Other outstanding events have been the defeat of the British by Andrew Jackson in 1815; the capture in 1862 by the Federal fleet; serious political troubles with fighting in 1874 and 1877; and the lynching in 1891 of eleven Italian maffiosi. In 1880 the capital of Louisiana was removed from New Orleans to Baton Rouge.

Newport, R. I. [The "City of Mansions"; named in honor of the English admiral Christopher Newport (under James I.).]

It was, until 1900, one of the capitals of Rhode Island, and lies on the west shore of the island, in Narragansett Bay, five miles from the ocean, and sixty-nine miles by railroad southwest of Boston. It has a deep and excellent harbor, defended by Fort Adams.

The town is noted for fine scenery, and is one of the most fashionable watering-places in America, containing some of the finest mansions in the United States. Bathing facilities are unrivaled, and there are many fashionable promenades.

The chief attractions are Touro Park, and the Old Mill, Cliff Walk, Bailey's Beach, and the Ocean Drive.

The central point of Old Newport is Washington Square, or the Parade, within a few minutes' walk of the railway station and steamboat wharf. Here are the State House, with portrait of Washington, by Stuart; the old City Hall (new one in Broadway, corner of Bull Street); a statue of Commodore O. H. Perry, the hero of Lake Erie; the Perry Mansion, and the Roman Catholic Church, with an Ionic portico.

Following Touro Street, to the southeast, is the Synagogue built in 1762 and the oldest in the United States; the Newport Historical Society; and, a little beyond, the picturesque Hebrew Cemetery. Touro Street ends here and Bellevue Avenue, the fashionable promenade, begins, running to the south.

The fine Fern-leaf Beech is at the corner of Bellevue Avenue and Redwood Street. Nearly opposite this is Touro Park, containing the Round Tower or Old Stone Mill, the origin of which is still somewhat of a mystery. Some authorities believe that it was built by Governor Arnold in the seventeenth century as a wind-mill, while others regard it as very possibly the central part of a church built by the Norsemen in the eleventh century. Longfellow mentions it in his *Skeleton in Armor*. The park also contains statues of M. C. Perry and W. E. Channing; and opposite its south side stands the Channing Memorial Church.

A few hundred paces farther on, Bath Road leads to the left from Bellevue Avenue to the First Beach.

Bellevue Avenue soon passes the Casino, a long, low, many-gabled building, containing a club, a theater, etc. The Lawn Tennis Championship of America is decided in the courts attached to the Casino. Farther on, the avenue passes between a series of magnificent villas, and then turns sharply to the right and ends at Bailey's Beach.

First or Easton's Beach, a strip of smooth hard sand, three-fourths mile long, affords some of the best and safest surf-bathing on the Atlantic coast. From the east end of the beach a road leads round Easton's Point to Purgatory, a curious fissure in the conglomerate rocks, one hundred and fifty feet long, seven to fourteen feet wide, and fifty feet deep.

At the west end of Easton's Beach begins the famous Cliff Walk, which runs along the winding brow of the cliffs for about three miles, with the ocean on one side and the smooth lawns of handsome homes on the other. Here are summer residences, owned by the wealthiest society people of Boston, New York, and other cities.

Across the hill is Bailey's Beach, a small bay with a long row of bathing-houses, which has become the fashionable bathing-resort of the Newport cottagers.

From Bailey's Beach begins the beautiful Ocean or Ten Mile Drive, which skirts the coast of the peninsula to the south of the town for about ten miles, commanding magnificent views.

The locality of Newport has many natural curiosities, including the Hanging Rocks, Spouting Cave, and the Glen, or "Purgatory," already referred to. Newport is the seat of the United States Naval War College, United States Training Station, Torpedo Station, Naval Hospital, Newport Hospital, and Hazard Memorial School.

The manufactures are flour, cotton goods, copper, brass, oil, etc.

Newport was settled in 1638 by eighteen adherents of Roger Williams, and was an important commercial town prior to the Revolutionary war, which effected its ruin and transferred its trade to New York. During the war it was occupied for three years by the British, and for a while by the French under Rochambeau. It was the birthplace of Commodore Perry and William Ellery Channing, and for a while the place of residence of Bishop Berkeley, the English philosopher.

New York City, N. Y. [The "Empire City"; also "Gotham"; named from the State which was named in honor of James, Duke of York, afterwards James II.]

It is now (1918) the largest city in the world, and, next to London, the wealthiest. The population of Metropolitan New York, including suburbs, is approximately 7,500,000.* Situated on New York Bay at the confluence of the Hudson and East Rivers, about twelve miles from the Atlantic Ocean, it consists of the boroughs of Manhattan, The Bronx, Brooklyn, Queens, and Richmond, which have a joint area of three hundred and twenty-six square miles. Its extreme length, north and south, is thirty-five miles, its extreme width nineteen miles.

Manhattan, or New York proper, consists mainly of Manhattan Island, a long and narrow tongue of land bounded by the Hudson or North River on the west and the East River (part of Long Island Sound) on the east and separated from the mainland on the north and northeast by the narrow Harlem River and Spuyten Duyvil Creek; but also includes several small islands in New York Bay and the East River.

Manhattan Island is thirteen and one-half miles long, with an average breadth of one and three-fifths miles, and with the exception of a small, wild, and rocky portion, which is utilized for ornamental purposes, the entire island is laid out in avenues and streets. It includes several greens and parks, and its area has been considerably extended by filling in on the two river-sides.

The strikingly beautiful landlocked harbor of New York includes the lower bay, the upper bay, the East River, and the North, or Hudson River. Ocean steamships enter it from the sea by Sandy

*The population of Greater London, including an area of 692¾ sq. mi., was, in 1911, 7,252,963. The modern administrative County of London, including the city, had in the same year a population of 4,522,961. New York City is increasing at the rate of about 1,000,000 in every seven years. The census figures of corporate New York, in 1916, was 5,602,841.

Hook through the Narrows, and coasting ships from the north through Long Island Sound. The North River averages a mile wide; the East River is not so wide, but both are deep enough for the largest ships, and furnish many miles of wharfage. The Harlem River, at the north end of Manhattan Island, connects the two great rivers.

The bar at Sandy Hook, eighteen miles south of the city, which divides the Atlantic Ocean from the outer or lower bay, is crossed by two ship-channels, from twenty-one to thirty-two feet deep at ebb-tide. The lower bay covers eighty-eight square miles. The Narrows, through which all large ships pass on their way to the inner harbor, is a strait between Long Island and Staten Island, about a mile in width, and like other approaches is defended by forts. New York's harbor or inner bay covers about fourteen square miles; it is one of the amplest, safest, and most picturesque on the globe, open all the year round.

Liberty Island, for a long time known as Bedloe's Island, is situated in the harbor, about one and three-fourths miles from the lower end of the city. In 1886 the famous Bartholdi statue was erected on this spot, and occupies its central surface. It is a colossal bronze female figure one hundred and fifty-one feet in height, on a pedestal one hundred and fifty-five feet high, and holding aloft a torch which is lit by electricity at night.

Immense bridges span the East River and Harlem River, and there are some thirty steam-ferries.

The New York and Brooklyn Suspension Bridge, opened in 1883, which cost twenty million dollars, was soon found inadequate for the enormous traffic, and a second bridge from Canal Street to Brooklyn was opened in 1909.

The Williamsburg Suspension Bridge, between Manhattan and Williamsburg, was opened in 1903. It cost twelve million dollars.

The Queensboro Bridge, of cantilever type, between Long Island and Fifty-ninth Street, was opened in 1909. Its cost was twenty million dollars.

In 1909 another bridge from Manhattan to Brooklyn, built at a cost of twenty-six million dollars, was completed.

The Harlem River is crossed by several bridges, of which the Washington is noteworthy as being one of the finest in America.

Hell Gate Arch Bridge spans the East River at Hell Gate, between Ward's Island and Astoria, Long Island. It was designed and built by Gustav Lindenthal for the New York Connecting Railroad to connect the Pennsylvania and New York, New Haven systems, at a cost, including approaches, of twenty-five million dollars. It is the longest arch in the world. The span is one thousand and sixteen feet ten inches between tower faces. The upper chord of the arch is three hundred feet above mean high water at the center and one hundred and eighty feet at the ends of the span; the lower chord is two hundred and sixty feet above mean high water at the center and forty feet at the ends; the roadway is one hundred and forty feet above mean high water.

Old New York is laid out very irregularly. Here the money interests and wholesale traffic are centered; Wall, New, and Broad Streets being the great centers of banking and speculative enterprises.

The newer part of the city, from Fourteenth Street to the end of the island, northward, is divided into twelve great avenues and several smaller ones, from seventy-five to one hundred and fifty feet in width, running north and south. These are crossed at right angles by streets, mostly sixty feet in width, running from river to river.

Fifth Avenue, the great modern central thoroughfare, divides the city into eastside and westside. Here or hereabout are the largest banks, churches, museums, libraries, shops, palaces, and tenements in America.

Fifth Avenue below Fifty-ninth Street is now largely occupied by store and office buildings where once were palatial private houses; and between Madison Square and Fifty-ninth Street contains many hotels and clubs, and the New York Public Library.

The original great thoroughfare, Broadway, runs a northwesterly course through the regular cross street arrangement, making some slight deflections, quite through the middle of the island.

For a distance of two and one-half miles from Fifty-ninth to One Hundred and Tenth Street, Central Park divides the city into two parts.

Other parks are Van Cortlandt, one thousand and sixty-nine acres; Pelham Bay, one thousand seven hundred acres; and Bronx Park, six hundred and sixty-one and sixty-one hundredths acres, containing the Botanical and Zoological Gardens. Prospect Park, Brooklyn, contains five hundred and sixteen and one-quarter acres. A recreation course, skirting the Harlem River, and reserved for fast driving, is the "Speedway," and extending along the Hudson for three miles is Riverside Drive, with its striking views of the Palisades. On an abrupt elevation is Morningside Park, on which are located the new buildings of Columbia University, St. Luke's Hospital, and the Cathedral of St. John the Divine. Beyond Morningside Park is a rocky ridge known as Washington Heights.

The most thickly settled part of Brooklyn borough is in the north, and the business portion is that part fronting on East River and the upper harbor. The southern part is largely marshland. At the southwestern extremity of Long Island, in this borough, stretches a sandbar known as Coney Island, on which are the widely-known popular summer resorts. Queensboro has several large population centers, among them Long Island City and Flushing. Richmond borough (Staten Island) contains numerous villages.

Communication throughout the city is afforded by an extensive system of electric surface, electric elevated roads, the great subway railroad system, and by ferries plying between the boroughs.

The subway has, for part of its course, four tracks, two of which are for express trains. It begins at the City Hall and traverses the whole length of Manhattan Island. The first length of eight miles to Washington Heights was opened in 1904. The following year the line was extended to the Battery, and also under the Harlem River into Bronx. In 1908 a further extension was opened between the Battery and Brooklyn by way of a tunnel. In 1909, a double-tube tunnel, the McAdoo, connected the city at Sixth Avenue and Twenty-third Street with Hoboken, N. J.

In 1910 several tunnels under the Hudson and East Rivers were opened. In 1913, the Dual system was created, comprising the transportation lines of four of the five boroughs; and the years 1917-1919 added numerous other subways, tunnels and terminals. A recent gigantic railway enterprise is the construction of the Pennsylvania tunnel under the Hudson River.

Some of the larger features of New York call for more detailed notice.

The architecture of New York exhibits great contrasts, including styles as diverse as the quaint old Dutch houses, and skyscrapers of twenty-five and thirty stories.

At the extreme south end of the island is the Custom House, a large quadrangular granite building, in the French Renaissance style, which occupies the site of Fort Amsterdam. The facade toward Bowling Green is adorned with colossal groups of Europe, Asia, Africa, and

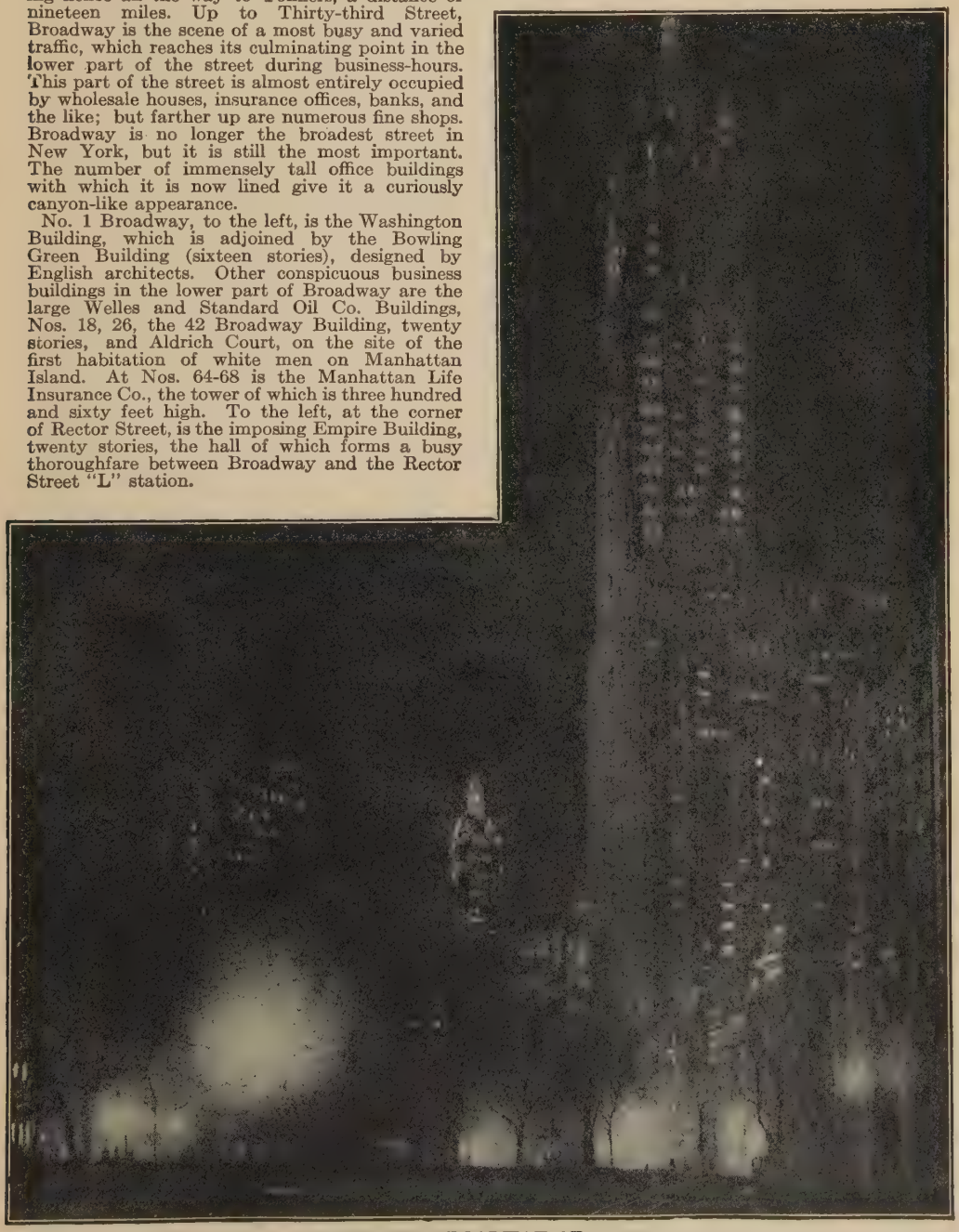
America, and with twelve heroic figures representing the great sea-powers.

In Whitehall Street, opposite the Custom House, is the Produce Exchange, a huge brick and terra cotta structure in the Italian Renaissance style, containing numerous offices and a large hall. The tower, two hundred and twenty-five feet high, commands a fine view of the city and harbor.

Broadway begins at the Bowling Green, extending hence all the way to Yonkers, a distance of nineteen miles. Up to Thirty-third Street, Broadway is the scene of a most busy and varied traffic, which reaches its culminating point in the lower part of the street during business-hours. This part of the street is almost entirely occupied by wholesale houses, insurance offices, banks, and the like; but farther up are numerous fine shops. Broadway is no longer the broadest street in New York, but it is still the most important. The number of immensely tall office buildings with which it is now lined give it a curiously canyon-like appearance.

No. 1 Broadway, to the left, is the Washington Building, which is adjoined by the Bowling Green Building (sixteen stories), designed by English architects. Other conspicuous business buildings in the lower part of Broadway are the large Welles and Standard Oil Co. Buildings, Nos. 18, 26, the 42 Broadway Building, twenty stories, and Aldrich Court, on the site of the first habitation of white men on Manhattan Island. At Nos. 64-68 is the Manhattan Life Insurance Co., the tower of which is three hundred and sixty feet high. To the left, at the corner of Rector Street, is the imposing Empire Building, twenty stories, the hall of which forms a busy thoroughfare between Broadway and the Rector Street "L" station.

Wall Street diverging from Broadway to the right, at this point, is the great financial street of New York, the financial barometer of the country. On this street stands the United States Sub-Treasury, a marble structure with a Doric portico, occupying the site of the old Federal Hall, in which the first United States Congress assembled, and Washington was inaugurated as President; the Drexel Building, a white marble structure in the Renaissance style, occupied by J. Pierpont



FAR-FAMED BROADWAY AT NIGHT

Morgan & Co.; the National City Bank, largest in the country, occupying the old Custom House.

Trinity Church, on the west side of Broadway, is a handsome Gothic edifice of brown stone, with a spire two hundred and eighty-five feet high. The present building dates from 1839-1846, but occupies the site of a church of 1696. The church owns property to the value of at least twenty million dollars used in the support of several subsidiary churches and numerous charities.

Just above Trinity Church are the enormous Trinity and United States Realty buildings, two dignified structures, the former with an admirable facade in a modified Gothic style, and nearly opposite are the Union Trust Co. and the twenty-three story building of the American Surety Co., the latter containing the United States Weather Bureau ("Old Probabilities"). On the same side, between Pine Street and Cedar Street, is the office of the Equitable Life Insurance Co.

The block to the left, between Liberty Street and Cortland Street, is occupied by the buildings of the Singer Manufacturing Co., the City Realty Co., and the City Investing Co. The tower of the Singer Building, with its forty-one stories, rises to a height of six hundred and twelve feet. Between Broadway and Park Row is the Post Office, a large Renaissance building.

City Hall, containing the headquarters of the Mayor of Greater New York and other municipal authorities, is a well-proportioned building of marble in the Italian style, with a central portico, two projecting wings, and a cupola clock tower.

To the north of the City Hall is the Court House, a large building of white marble, with its principal entrance, garnished with lofty Corinthian columns, facing Chambers Street. The interior, which contains the State Courts and several municipal offices, is well fitted up. This building, one of the "Tweed ring" structures, is said to have cost twelve million dollars. Opposite the Court House, in Chambers Street, are various City Offices. These include the new Register Office or Hall of Records, a handsome building in the French Renaissance style, erected at a cost of six million dollars and faced with granite. The facade is adorned with sculptures, and the interior is also elaborately decorated. To the southwest of the City Hall, facing Broadway, is a statue of Nathan Hale.

Park Row, bounding the southeast side of the City Hall Park, contains the offices of many of the principal New York newspapers, the Pulitzer Building, with the World office, Tribune Building, New York Press, and Park Row Building with its lofty towers. Opposite the newspaper offices, in Printing House Square, is a bronze statue of Benjamin Franklin, and in front of the Tribune Building is a seated bronze figure of its famous founder, Horace Greeley.

Beyond Astor Place, Broadway passes the large building occupied by John Wanamaker, but originally erected for A. T. Stewart & Co. With its new annexes, it is heralded as the largest department store in the world.

Broadway now inclines to the left. At the bend rises Grace Church, which, with the adjoining rectory, chantry, and church-house, forms one of the most attractive ecclesiastical groups in New York. The church is of white limestone and has a lofty marble spire. The interior is well-proportioned, and all the windows contain stained glass.

At Fourteenth Street Broadway reaches Union Square, which is beautified with pleasure grounds, statues, and an ornamental fountain. At the corner of East Sixteenth Street is the massive office building of the Bank of Metropolis. Near the southeast corner is a good equestrian statue of Washington, in the center of the south side is a bronze statue of Lafayette, in the southwest corner is a statue of Abraham Lincoln, and on the west side is the James Fountain.

Broadway, between Union Square and Madison Square, is one of the chief shopping-resorts of New York, containing many fine stores for the sale of furniture, dry goods, etc. At Twenty-third Street it intersects Fifth Avenue and at the point of intersection stands the daring Fuller Building, generally known as the "Flat-iron Building" on account of its strange triangular shape. It is two hundred and ninety feet high, has twenty stories, and cost four million dollars.

Broadway now skirts the west side of Madison Square, a prettily laid out public garden, containing a bronze statue of Admiral Farragut, an obelisk to the memory of General Worth, a statue of Roscoe Conkling, a statue of President Arthur, and a statue of William H. Seward. The statue of Farragut is among the finest in New York, and the imaginative treatment of the pedestal is very beautiful. On the west side of the square is the new Fifth Avenue Building.

On the east side is the new Appellate Court House, a handsome building, perhaps somewhat overloaded with ornamentation.

On the east side of the square, between Twenty-third and Twenty-fourth Streets, is the enormous building of the Metropolitan Life Insurance Co., the tower of which has fifty stories and reaches a height of six hundred and ninety-three feet. Two elevators run to a height of five hundred and forty-four feet. Adjacent is the Madison Square Presbyterian Church, with its massive dome. At the southeast corner of Twenty-sixth Street stands the Manhattan Club, and at the northeast corner is the huge Madison Square Garden, with its Moorish tower capped by a fine statue of Diana.

The Herald Office, a Venetian palace, stands at Broadway and Thirty-fifth Street, in Herald Square.

West of Herald Square, at Seventh Avenue and Thirty-third Street, is the magnificent station of the Pennsylvania Railroad Company, covering an area four hundred and fifty by one thousand eight hundred feet, the largest structure of the kind in the world, connected by tunnels under the Hudson River with New Jersey, and under the East River with Long Island. The tracks are forty feet below the level of the city streets.

The Metropolitan Opera House, opened in 1883 and rebuilt ten years later, after a fire, stands between Thirty-ninth and Fortieth Streets.

At Forty-second Street and Broadway is the Times Building, an ornamental structure sixteen stories high, upon a triangle of ground.

To the east of Madison Avenue is the Grand Central Station, the terminus of the New York Central, the New York, New Haven and Hartford, and the Harlem Railways. Opposite the station is the Belmont Hotel, twenty-two stories high.

The corner at Broadway and Forty-second Street is the recent heart of the theatrical and hotel district, for clustered there are a dozen hotels, the immense Astor and Knickerbocker among them, and there are twenty theaters within half a mile, six of them almost side by side on Forty-second Street.

Beyond Times Square, Broadway is rather uninteresting, but there are some lofty specimens of apartment houses or French flats farther up. From Forty-fifth Street on, Broadway is largely occupied by automobile stores and garages. At the corner of Fifty-sixth Street is the new Broadway Tabernacle and at Fifty-ninth Street Broadway reaches the southwest corner of Central Park and intersects Eighth Avenue.

At the intersection, the so-called Circle, stands the Columbus Monument by Gaetano Russo,

erected in 1892, and consisting of a tall shaft surmounted by a marble statue, in all seventy-seven feet high. Beyond Seventy-eighth Street, Broadway, now a wide street with rows of trees, is usually known as the Boulevard. From One Hundred and Eighth Street to One Hundred and Sixty-second Street it coincides with Eleventh Avenue, at One Hundred and Sixteenth Street it passes Columbia University, and from One Hundred and Sixty-second Street it, as Kingsbridge Road, runs on to Yonkers.

Fifth Avenue, the chief street in New York from the standpoint of wealth and fashion, begins at Washington Square to the north of West Fourth Street and a little to the west of Broadway, and runs north to the Harlem River, a distance of six miles. Below Forty-seventh Street the Avenue has now been largely invaded by shops, tall office buildings, and hotels. The avenue has been kept sacred from the marring touch of the street railway or the elevated railroad, and is traversed by a line of motor omnibuses. The avenue is wide and well-paved, and many of the buildings are of brown sandstone. On a fine afternoon Fifth Avenue is alive with carriages and horsemen on their way to and from Central Park and it is, perhaps, seen at its best on a fine Sunday.

At Twenty-third Street the Avenue intersects Broadway and skirts Madison Square. To the right is the Flat-iron Building. At Twenty-sixth Street is the Café Martin.

The whole block between Thirty-third and Thirty-fourth Streets, to the left, is occupied by the Waldorf-Astoria Hotel, a huge double building of red brick and sandstone in a German Renaissance style. The restaurants and other large halls in the interior are freely adorned with mural paintings by American artists.

The Union League Club, the chief Republican club of New York, is a handsome and substantial building at the corner of Thirty-ninth Street.

Between Fortieth Street and Forty-second Street, to the left, on the site of the old reservoir of the Croton Aqueduct, stands the New York Public Library, a very dignified and imposing structure of white marble, built at a cost of ten million dollars.

A little to the east of this point, in Forty-second Street, is the Grand Central Station already referred to. At the southeast corner of Forty-second Street rises the tasteful Columbia Bank. The Temple Emanu-El, or chief synagogue of New York, at the corner of Forty-third Street, is a fine specimen of Moorish architecture with a richly decorated interior.

At the northeast corner of Forty-fourth Street is Delmonico's Restaurant, a substantial building with elaborate ornamentation; and at the southwest corner is Sherry's, a rival establishment, equally patronized by the fashionable world.

The Collegiate Church of St. Nicholas (Dutch Reformed), at the corner of Forty-eighth Street, is one of the handsomest and most elaborately adorned ecclesiastical edifices in the city. It is in decorated Gothic style and has a spire two hundred and seventy feet high. Just below Fiftieth Street, on the right, is the Democratic Club, the stronghold of Tammany and popularly known as "Tamany Hall" or the "Wigwam."

Between Fiftieth and Fifty-first Streets, to the right, stands St. Patrick's Cathedral, an extensive building of white marble in the decorated Gothic style, and the most important ecclesiastical edifice in the United States. It is four hundred feet long, one hundred and twenty-five feet wide and one hundred and twelve feet high, and the two beautiful spires are three hundred and thirty-two feet high. The building, which was designed by James Renwick, was erected in 1850-1879, at a cost of three million five hundred thousand dollars.

Adjoining the cathedral, to the right, is the handsome Union Club, and at the corner of Fifty-fourth Street is the University Club, adorned with carvings of the seals of eighteen American colleges. The library contains admirable mural paintings, adapted from Pinturicchio's work in the Borgia apartments of the Vatican. At the corner of Fifty-fifth Street are the St. Regis Hotel and the Gotham Hotel. The Fifth Avenue Presbyterian Church has one of the loftiest spires in the city.

Between Fifty-ninth and One Hundred and Tenth Streets Fifth Avenue skirts the east side of Central Park, having buildings on one side only. Among these, many of which are very handsome, is the Metropolitan Club.

At Fifty-ninth Street, where Fifth Avenue reaches Central Park, are three huge hotels: the New Plaza, the Savoy, and the Netherland. In the middle of the Plaza rises a bronze-gilt equestrian statue of General Sherman, of fine artistic merit.

Mt. Sinai Hospital is between One Hundredth and One Hundred and First Streets.

In Central Park, close to Fifth Avenue at Eighty-second Street, is the Metropolitan Museum of Art.

At One Hundred and Twentieth Street Fifth Avenue reaches Mount Morris Square, the mound in the center of which commands good views. Beyond Mt. Morris Square the Avenue is lined with handsome villas, some of them surrounded by gardens. It ends in a district of tenements and small shops at the Harlem River.

New York has many public parks, the finest of which is the Central Park. The district in which it is located was once a wilderness of rocks and swamps. Plans by Frederick Law Olmsted and Calvert Vaux were so admirably carried out as to make the Central Park in ten years one of the most beautiful pleasure-grounds in the world.

Of its eight hundred and forty acres, four hundred are wooded. There are nine miles of drives, with thirty miles of paths, several lakes used for boats in summer and for skating in winter, immense lawns for baseball, tennis, etc., a zoological garden, and conservatories.

The chief promenade is the Mall, near the Fifth Avenue entrance, which is lined with fine elms and contains several statues and groups of sculpture, including Shakespeare, Scott, Burns, Halleck, Columbus, and the Indian Hunter. From the Terrace, at the north end of the Mall, flights of steps descend to the Bethesda Fountain and to the Lake, used for boating in summer and skating in winter. The most extensive view in the park is afforded by the Belvedere, which occupies the highest point of the Ramble, to the north of the Lake.

The North Park, beyond the Croton Reservoir, has fewer artificial features than the South Park, but its natural beauties are greater, and the Harlem Mere, of twelve acres, is very picturesque. Near the southeast corner of the park (nearest entrance in Sixty-fourth Street) are the Old State Arsenal and a small Zoological Garden. On the west side of the park is the American Museum of Natural History, and on the east side is the Metropolitan Museum of Art. To the west of the latter museum rises Cleopatra's Needle, an Egyptian obelisk from Alexandria, presented by Khedive Ismail Pasha to the City of New York in 1877. The obelisk is of red syenite, is sixty-nine feet high and weighs two hundred tons. Among the other monuments in the park are statues of Webster, Bolivar, Hamilton and Morse, allegorical figures of Commerce and the Pilgrim, and several busts and animal groups. Just outside the park, beside the Sixth Avenue entrance, is a statue of Thorwaldsen.

In Manhattan Square, on the west side of Central Park, between Seventy-seventh and

Eighty-first Streets, stands the American Museum of Natural History, which contains collections of natural history, paleontology and ethnology.

CENTRAL PARK TERRACE, NEW YORK

The Metropolitan Museum contains paintings, statuary, ivories, tapestries, porcelains, Greek, Roman, and Egyptian antiquities. Beginning with one structure erected by the city at a cost of five hundred thousand dollars in 1880, it now comprises a series of buildings which cost several million dollars. The collections of paintings, sculpture, antiquities, porcelains, jades, armor, etc., are valued at ten million dollars, most of which has been contributed by art lovers of the city. In 1903 the institution received a bequest of six million dollars from the well-known locomotive builder John T. Rogers, which has enabled it to compete with other great museums.

At the corner of Morningside Avenue and One Hundred and Twelfth Street is the new Episcopal Cathedral of St. John the Divine, designed by Heins and La Farge, the corner-stone of which was laid in 1892, but the building of which has not progressed very far. The Crypt, including the curious Tiffany Chapel of mosaic glass, and the Belmont or St. Saviour's Chapel are the only portions completed. To the north of this, in the block bounded by Morningside Avenue, Tenth Avenue, One Hundred and Thirteenth Street, and One Hundred and Fourteenth Street, is the large building of St. Luke's Hospital, constructed of white marble and white pressed brick, with a tower and clock over the main entrance.

To the northwest of this point, on a magnificent site extending from One Hundred and Fourteenth Street to One Hundred and Twenty-first Street, one hundred and ten to one hundred and fifty feet above the Hudson River, are the new buildings of Columbia University, the oldest, largest, and most important educational institution in New York. The finest building in the center of the group is the Low Memorial Library, built at a cost of one million dollars.

On a commanding site bounded by One Hundred and Thirty-eighth Street, Amsterdam Avenue, One Hundred and Fortieth Street, and St. Nicholas Terrace, are the imposing new buildings of the College of the City of New York, erected in 1903-1908 by Mr. George B. Post, in the low-arch Gothic style, at a cost of nearly five million dollars, and notable for their uniformity of design and symmetry of grouping.

Among other educational institutions are the Normal College, at Sixty-ninth Street and Park Avenue; the College of Physicians and Surgeons; the New York University; Cooper Union, in which nearly all the courses are free; St. John's (Fordham), Manhattan, and St. Francis Xavier, Roman Catholic colleges; the National Academy of Design; Society of American Artists; the Art Students' League; Chase Art School; New York Institute of Music, and various theological schools.

Riverside Drive or Park, skirting the hills fronting on the Hudson from Seventy-second Street to One Hundred and Twenty-seventh Street, affords beautiful views of the river and is one of the most striking roads of which any city can boast. It has become, perhaps, the most attractive residential quarter of New York, though a great architectural opportunity has been lost in the buildings that border it, these consisting largely of apartment hotels, remarkable mainly for their size.

Near the north end of the drive, on Claremont Heights (West One Hundred and Twenty-second Street), is the Tomb of General Ulysses S. Grant, a huge and solid mausoleum of white granite, erected in 1891-1897 at a cost of six hundred thousand dollars, from a design by J. H. Duncan. The monument consists of a lower story in the Doric style, ninety feet square, surmounted by a cupola borne by Ionic columns. The total height is one hundred and fifty feet.

John Verrazani, a Florentine navigator, was the first European who entered New York Bay (1525). In 1614 the Dutch built a fort on Manhattan Island, and in 1623 a permanent settlement was made, named Nieuw Amsterdam. In 1674 Manhattan Island came into the possession of Great Britain. At the Revolution the population was less than that of Philadelphia or Boston. It was evacuated by the forces of Great Britain in 1783, and from 1785 to 1789 was the seat of government of the United States. The opening of the Erie Canal in 1825 gave a vast impetus to New York City's growth. The city by 1874

had extended beyond the Harlem River and a part of Westchester County was incorporated in it. In 1896 a law was passed consolidating with New York City, Brooklyn (Kings County), Long Island City, Staten Island, Westchester, Flushing, Newtown, Jamaica, and parts of Eastchester, Pelham, and Hempstead. By the charter adopted in 1897 this territory was divided into the boroughs of Manhattan, Brooklyn, Bronx, Richmond, and Queens. A new charter was secured in 1907 under which the mayor presides over the entire city, with absolute power of appointment and removal of the heads of all city departments. In 1911 a new charter was drawn up which evoked considerable opposition, as it seemed to place still greater powers in the hands of the mayor.

Philadelphia (*fil-ā-del'fi-ā*), **Pa.** [The "Quaker City"; named from two Greek words meaning "loved or friendly," and "brother," applied as "brotherly love." The Indian name of the locality was *Coaquannok*, "grove of tall pine trees."]

The chief city of Pennsylvania and the third city in population and importance of the United States, it is situated on the Delaware River, about one hundred miles by ship-channel (via Delaware Bay) from the Atlantic Ocean, ninety miles by railroad southwest of NewYork City, and one hundred and thirty-six miles northeast of Washington.

The city occupies mainly a broad plain between the Delaware and the Schuylkill Rivers. It is twenty-two miles long from north to south and five to ten miles wide, covering one hundred and thirty square miles, and is laid out with chessboard regularity. The characteristic Philadelphia house is a two-storied or three-storied structure of red pressed brick, with white marble steps. The two rivers give it about thirty miles of water-front for docks and wharfage, and it is the headquarters of two of the greatest American railways—the Pennsylvania and the Reading.

The great wholesale business thoroughfare is Market Street, running east and west between the two rivers, while Chestnut Street, parallel with it on the south, contains the finest shops, many of the newspaper offices, etc. Broad Street is the chief street running north and south. Among the most fashionable residence quarters are Rittenhouse Square and the west parts of Walnut, Locust, Spruce, and Pine Streets. Eighth Street is the great district for shops and amusements.

The City Hall (or Public Buildings) is in the center of the city at the intersection of Broad and Market Streets. The structure is the largest exclusively municipal building in the world. It is built of white marble upon a granite base, in French Renaissance style, and covers an area of four hundred and eighty-six by four hundred and seventy feet. The height of the tower and dome is five hundred and thirty-seven feet four and one-half inches; or five hundred and seventy-three feet four and one-half inches with the colossal figure of Penn (thirty-six feet), to surmount the whole. The entire cost, when completely furnished for occupancy, was estimated at twenty-five million dollars.

The broad pavement round the City Hall is adorned with statues of General Reynolds, General McClellan, Stephen Girard, John C. Bullitt, President McKinley, and Joseph Leidy, the naturalist, and with the "Pilgrim" by Saint-Gaudens.

On the west side of City Hall Square, opposite the City Hall, is the enormous Broad Street Station of the Pennsylvania Railroad. The waiting-room contains a large allegorical relief, while one wall is covered with a mammoth railway map of the United States. On the north

GRANT'S TOMB, RIVERSIDE DRIVE, NEW YORK

side of the square, at the corner of Broad Street and Filbert Street, is the Masonic Temple, a huge granite structure with a tower two hundred and fifty feet high and an elaborately carved Norman porch.

On the east side of the square, occupying the block bounded by the square, Market Street, Thirteenth Street, and Chestnut Street, is Wanamaker's Store, one of the largest in the United States. On the south side of the square is the Betz Building, with heads of the Presidents of the United States in the bronze cornice above the third-story windows.

Chestnut Street is the chief street of Philadelphia, containing many of the handsomest and most interesting buildings. To the left, at the corner of Broad Street and adjoining the Betz Building, is the Franklin National Bank, while to the right rises the fine office of the Real Estate Trust Co. At the corner of Twelfth Street is the tall Commonwealth Trust Building, and at the corner of Tenth Street, on the same side, is the New York Mutual Life Insurance Co.

Between Tenth and Ninth Streets, to the left, are the Mortgage Trust Co., the Penn Mutual Life Building, with an elaborate facade, and the office of the *Philadelphia Record*. At the corner of Ninth Street, extending on the north to Market Street, is the Post Office, a large granite building in the Renaissance style, erected at a cost of five million dollars. It also contains the United States Courts and the offices of various Federal officials. In front of the Post Office is a colossal seated figure of Benjamin Franklin. Between Eighth and Seventh Streets is the orna-

mented front of the Union Trust Co. This neighborhood contains several newspaper offices. At the corner of Sixth Street, on the Public Ledger Building, is another statue of Franklin.

In Seventh Street, a little to the north of Chestnut Street, is the Franklin Institute with a library, museum and lecture-hall.

Between Fifth and Sixth Streets is Independence Hall, or the old State House, a modest brick edifice (1732-1735), which is in some respects the most interesting building in the United States. Here the Continental Congress met during the American Revolution (1775-1781), and here, on July 4th, 1776, the Declaration of Independence was adopted. In 1897-1898 the whole building was restored as far as possible to its original condition.

The Custom House, with a Doric portico, was originally erected in 1819-1824 for the United States Bank. It is copied from the Parthenon, and considered one of the best examples of Doric architecture in the world.

A lane diverging to the right between Fourth and Third Streets, opposite the Fidelity Trust Co., leads to Carpenters' Hall, where the First Colonial Congress assembled in 1774. It contains the chairs used at the Congress, various historical relics, and the inscription: "Within these walls Henry, Hancock, and Adams inspired the delegates of the colonies with nerve and sinew for the toils of war." Chestnut Street ends at the Delaware River.

Walnut Street runs parallel to Chestnut Street, one block to the south. In this street, at the intersection of Dock Street and Third Street, is the Stock Exchange, formerly the Merchants Exchange, with a semi-circular portico facing the river. Near it, in Third Street, is the Girard Bank, built for the first United States Bank and long owned by Stephen Girard. At Fourth Street is the building of the Manhattan Insurance Co.

Walnut Street now crosses Broad Street, to the west of which it consists mainly of private residences. Between Eighteenth and Nineteenth Streets we pass Rittenhouse Square, a fashionable residence quarter.

At the corner of Broad and Chestnut Streets are the white marble building of the Girard Trust Co., with a rotunda, and the tall Land Title Building.

North Broad Street, beginning on the north side of the City Hall Square, a handsome street one hundred and thirteen feet wide, contains in its upper portion many of the finest private residences in Philadelphia. To the right, at the corner of Filbert Street, is the Masonic Temple, which is adjoined by the Arch Street Methodist Episcopal Church. On the opposite side of the street are the tall buildings of the United Gas Improvement Co. and the Fidelity Mutual Life Association. To the right is the Odd Fellows' Temple.

To the left, at the corner of Cherry Street, is the Pennsylvania Academy of the Fine Arts, a building in the Venetian style of architecture. The Academy was founded in 1805. Besides its collections it supports an important art-school, the lecture hall of which is adorned with effective decorations by the pupils. Its collections include five hundred paintings, numerous sculptures, several hundred casts, and fifty thousand engravings. The early American school is especially well represented.

On the west side of Broad Street, between Race and Vine Streets, are the Hahnemann College and Hospital, one of the chief homœopathic institutions of the kind. To the right, at the corner of Spring Garden Street, is the Spring Garden Institute for instruction in drawing, painting, and the mechanic arts. Opposite are the Baldwin Locomotive Works, a highly interesting industrial establishment.

A little farther on is the Boys' Central High School, an unusually large and handsome structure, and the Synagogue Rodef Shalom, in a Moorish style.

Farther up Broad Street are numerous handsome private houses, churches, and other edifices. At the northwest corner of Broad Street and Girard Avenue is the handsome Widener Mansion, presented to the city and used as a branch of the Free Library. Beyond Master Street, to the left, is the elaborate home of the Mercantile Club. Beyond this Broad Street runs out to Germantown, six miles from the City Hall.

Girard Avenue runs west from North Broad Street to Girard College, one of the richest and most notable philanthropic institutions in the United States. It was founded by Stephen Girard, a native of France, for the education of male orphans. The original bequest of over five million dollars has increased to about thirty-five million dollars.

The main building is a dignified marble structure in the Corinthian style, resembling the Madeleine at Paris. In the vestibule are a statute of Stephen Girard, and his sarcophagus. A room on the ground floor contains several relics of him.

Market Street is the chief wholesale business thoroughfare of the city. A little to the east of City Hall Square it passes the Philadelphia & Reading Railway Station, a tall Renaissance building with a train shed little smaller than that of the Pennsylvania Railroad. The department store of Gimbel Brothers, on the south side of the street, between Eighth and Ninth Streets, is one of the largest in the world. The Penn National Bank, at the corner of South Seventh Street, occupies the site of the house in which Jefferson wrote the Declaration of Independence.

South Broad Street leads to the south from City Hall Square. Its intersection with Chestnut Street, just to the south of the City Hall, is environed with tall office buildings. To the right is the annex of the Land Title Building, extending to Sansom Street. Opposite, adjoining the Real Estate Trust Co., is the North American Building, named after the newspaper which occupies it. Below is the Union League Club, the chief Republican club of Pennsylvania. On the same side is the large Bellevue-Stratford Hotel, the leading hotel of Philadelphia, and one of the great hostelries of the country. Farther on, to the right, is the Art Club, in the Renaissance style, in which exhibitions of paintings, concerts, and public lectures are held. At Locust Street, to the right, is the Academy of Music, while to the left is the Pennsylvania School of Industrial Art, incorporated in 1876, with a special view to the development of the art industries of Pennsylvania. A characteristic feature is the department of weaving and textile design. The Industrial Museum Hall is connected with this excellent institution.

Below Pine Street, Broad Street contains few important buildings. Of special note, however, is the Ridgway Library, which stands to the left, between Christian and Carpenter Streets, nearly one mile from the City Hall. This handsome building was erected with a legacy of one million five hundred thousand dollars left by Dr. Rush in 1869, as a branch of the Philadelphia Library. Adjoining the main hall is the tomb of the founder.

Broad Street ends, four miles from the City Hall, at League Island Park, three hundred acres in extent. League Island itself, in the Delaware, contains a United States Navy Yard.

West Philadelphia, the extension of the city beyond the Schuylkill, contains many of the chief residence streets and several public buildings and charitable institutions.

The University of Pennsylvania, founded in 1740, and removed to West Philadelphia in 1872, occupies a group of more than thirty buildings scattered over an area of sixty acres bounded by Woodland and Cleveland Avenues and Pine and Thirty-second Streets.

The College, the Medical School, Dental School, and Law School, are all provided with spacious and well-equipped buildings. Houston Hall, behind College Hall, is the social center of the University student life. The Wistar Institute of Anatomy and Biology is recognized as the headquarters of anatomical research in the United States and contains the first museum of human anatomy founded in America. The Morgan Laboratory of Physics, the Harrison Laboratory of Chemistry, the Gymnasium, and the Dormitories are all notable structures. Franklin Field, adjoining Thirty-third Street, is the athletic ground of the University and contains a large stadium.

The Museum of Science and Art occupies a tasteful building in South Street, owing part of its inspiration to the Certosa at Pavia, and is divided into five sections. Its value is largely due to the fact that many of its contents were found by expeditions organized by the University itself.

A little to the northeast, at the corner of Chestnut Street and Thirty-second Street, is the Drexel Institute, founded by A. J. Drexel, and opened in 1892. The total cost of buildings and equipment was four million five hundred thousand dollars.

Fairmount Park, the chief park of Philadelphia, is one of the largest in the world, and covers an area of three thousand three hundred and forty acres. The park proper extends along both banks of the Schuykill for about four miles, and the narrow strip along the Wissahickon, six miles, and one of the noted drives of the world, is also included in the park limits. The principal entrances are at the end of Green Street, which is connected with the City Hall by the wide Park Boulevard, and at Girard Avenue.

In this park, in 1876 was held the Centennial Exhibition; and in its environs are the Zoological Garden, the Fairmount Waterworks, which supply to the city one hundred million gallons of water daily, the beautiful Horticultural Hall and Memorial Hall, built as part of the Centennial Exhibition of 1876 at a cost of one million five hundred thousand dollars, and now containing a permanent collection of art and industry known as Pennsylvania Museum of Industrial Art.

At Sackamaxon, in Beach Street, is the small Penn Treaty Park, supposed to occupy the spot where Penn made his treaty with the Indians in 1682, under an elm that has long since vanished, a treaty, in the words of Voltaire, "never sworn to and never broken."

In its manufacturing products Philadelphia ranks next to New York. There are upward of twenty thousand manufacturing establishments, the combined output of which amounts to more than eight hundred million dollars. The chief products are locomotives, sugar and molasses, men's clothing, foundry and machine-shop products, carpets and rugs, hosiery and knit goods, woolen and cotton goods, malt liquors, morocco, chemicals, packed meat, refined petroleum and silk, and silk goods. The great Cramp shipbuilding yards are on the Delaware River. The Baldwin Locomotive Works are the largest in the world.

Philadelphia was founded by William Penn in 1682, the year after was made the capital of Pennsylvania, and soon became a place of importance. It was the central point in the War of Independence, where the first Continental Congress met, September 4, 1774, and where the Declaration of Independence was adopted in 1776. At Philadelphia, also, the Federal Union was signed, in 1778; and here, too, the Constitution of the United States was framed, in 1787. An interest of another kind attaches to the fact that the Protestant Episcopal Church of North America was organized here in 1786. From 1790 to 1800 Philadelphia was the Federal Capital; and the first mint was established here in 1792. Later events have been the holding of the Centennial Exhibition, in 1876, and the commemoration of Penn's landing in 1882.

Pittsburgh, Pa. [The "Smoky City," "Iron City"; named in 1758, when the French had been driven out by Washington; Fort Pitt, after William Pitt, Earl of Chatham, the name Pittsburgh being adopted in 1769.]

It is the second city of Pennsylvania and one of the chief industrial centers of the United States, and occupies the tongue of land between the Monongahela and the Allegheny, which here unite to form the Ohio, and also a strip of land on the south side of the Monongahela. The sister city, Allegheny, situated on the north bank of the Allegheny and extending down to the Ohio, was incorporated with Pittsburgh in 1907 and is now known as the North Side. The rivers are crossed by numerous bridges.

Smithfield Street, diverging from Liberty Avenue, not far from the Union Station, leads to the river Monongahela, on the other side of which, from Washington Heights, may be obtained a fine view of the city. On Liberty Avenue, to the right, is the City Hall a fine structure of white sandstone. A little farther on, to the left, is the Post Office. At the bridge are the Monongahela Hotel and the Baltimore & Ohio Station.

Crossing the Smithfield Street Bridge, Mt. Washington (three hundred and seventy feet) may be ascended by one of the three inclined railways on this side. These interesting, but at first somewhat startling, pieces of apparatus are worked by cables and transport horses and carriages as well as persons.

The finest building in Pittsburgh is the Allegheny County Court House, in Grant Street, a splendid example of H. H. Richardson's treatment of Romanesque, erected in 1888 at a cost of two million five hundred thousand dollars. The massive Prison is connected with the Court House by a finely handled stone bridge. The main tower is three hundred and twenty feet high. The government building cost one million five hundred thousand dollars.

Other buildings of importance are the Frick Building, a granite office structure of twenty stories at the corner of Fifth Avenue and Grant Street; the Carnegie Building and the Farmers' Bank Building (these two also in Fifth Avenue); the Union National Bank Building and the Commonwealth Trust Co. Building, in Fourth Avenue; the First Presbyterian Church, in Sixth Avenue; the Fulton Building, and the Bessemer Building (the last two at the corner of Sixth Street and Duquesne Way).

More to the east are the Academy of Our Lady of Mercy and the new Calvary Episcopal Church (at the corner of Shady Avenue and Walnut Street), a beautiful example of thirteenth century Gothic. The Roman Catholic Cathedral of St. Paul stands in Fifth Avenue, at the corner of Craig Street.

To the east of the city lies Schenley Park, containing the fine Phipps Conservatory and the Hall of Botany. Near the Forbes Street entrance to the Park is the great central building of the Carnegie Library of Pittsburgh, in which are housed not only the main collection of the library, but also two of the three departments of the Carnegie Institute. The structure, originally built in the Italian Renaissance style at a cost of eight hundred thousand dollars, was remodeled

and enlarged in 1904-1907 at an additional cost of five million dollars. The city is also the seat of Pittsburgh University, Holy Ghost College, and Penn's College for Women. The great iron and steel works have made the prosperity and reputation of Pittsburgh. Among these are the Edgar Thomson Steel Works, the Homestead Steel Works, the Duquesne Steel Works, the American Bridge Co., the Jones & Laughlin Works, the Oliver Iron & Steel Co., the Crescent Steel Works, and the Pressed Steel Car Co.

Its manufactures include everything, indeed, which can be made of iron, from a fifty-eight-ton gun to nails and tacks; steel in its various applications; electrical machinery and appliances; all descriptions of glass and glassware; silver and nickel-plated ware; Japan and Britannia ware; pressed tin, brass, copper, bronzes; Portland cement, earthenware, crucibles, fire-pots, bricks; furniture, wagons and carriages; brushes, bellows, mechanical supplies of all kinds; natural-gas fittings, and tools for oil and gas wells. Pittsburgh has, also, the largest manufactory of cork, and the largest pickling and preserving establishment in the world.

In 1754 a few English traders built a stockade here, but were driven away by the French. The latter replaced the stockade by a fort, which, in honor of the Governor of Canada, they called Duquesne. In 1758 it was taken by the English, who next year commenced a large and strong fortification, which, in honor of the elder Pitt, then Prime Minister, they called Fort Pitt. The settlement became a borough in 1804, and in 1816 was incorporated as the city of Pittsburgh. In 1872 the limits of the city were extended across the Monongahela, and by 1906 it extended over twenty-eight square miles. In 1907 Allegheny City (in spite of the opposition of a large majority of its inhabitants) was annexed; the Supreme Court of the United States declared the act valid, and thus Allegheny became the North Side of the present Pittsburgh.

Richmond, Va. [Named from Richmond-on-the-Thames, a suburb of London; the name suggested owing to analogy in situation.]

It is the capital of Virginia, on the left bank of the James River, at the head of tide water, one hundred and fifty miles from its mouth, and one hundred and sixteen miles by rail south of Washington. It is a port of entry, and vessels drawing sixteen feet of water can come up to the lower end of the city, where there are large docks. Richmond is picturesquely situated on a group of hills, and fine water power is afforded by the James River, which descends one hundred and sixteen feet in nine miles.

Near the center of the city, on Shockoe Hill, is Capitol Square, a tree-shaded area of twelve acres. The Capitol, or State House, partly designed after the Maison Carrée at Nîmes, France, occupies the highest point of the square and dates from 1785. The wings were added in 1906.

In the Central Hall, surmounted by a dome, are Houdon's statue of Washington (which Washington himself is said to have seen in its present position) and a bust of Lafayette by the same artist. The Senate Chamber, to the right, was used as the Confederate House of Representatives during the Civil War. The House of Delegates, to the left, contains portraits of Chatham and Jefferson, and was the scene of Aaron Burr's trial for high treason in 1807, and of the State Secession Convention in 1861.

Capitol Square also contains a fine equestrian statue of Washington, with figures of Patrick Henry, George Mason, Thomas Jefferson, Thomas Nelson, Andrew Lewis, and Chief Justice Marshall round the pedestal; a statue of Stonewall Jackson; a statue of Hunter Holmes McGuire, the most noted surgeon of the South; and a statue of Henry Clay. At the northeast corner of the square stands the Governor's Mansion.

On the north side, in Broad Street, is the City Hall, a handsome Gothic structure with a clock-tower. To the east of the Capitol is the State Library. In Twelfth Street, at the corner of Clay Street, a little to the north of Capitol Square, is the Jefferson Davis Mansion, or "White House of the Confederacy," occupied by Mr. Davis as President of the Southern Confederacy. It is now fitted up as a Museum of Confederate Relics.

St. John's Church, erected in 1740, but since much enlarged, is at the corner of Broad and Twenty-fourth Streets. The Virginia Convention was held in this church in 1775, and it was here that Patrick Henry made his famous "give me liberty or give me death" speech.

On Monument Avenue (a prolongation of Franklin Street) is the equestrian statue of General Lee. Adjacent is an equestrian statue of General J. E. B. Stuart, and a half mile farther on, at the west end of the avenue, is the Jefferson Davis Monument, consisting of a semi-circular colonnade with a pillar supporting an allegorical female figure and inscribed "Deo Vindice," with a heroic statue of the ex-president in front. A little to the east of the Lee Statue is Richmond College, a leading educational institution of Virginia.

Among other points of interest in Richmond are the Westmoreland Club, at the corner of Grace and Sixth Streets; the Commonwealth Club, at the corner of Franklin and Madison Streets; the Virginia Club, 2311 East Grace Street; Chief Justice Marshall's House; the Tobacco Exchange, Shockoe Slip; the University College of Medicine; the Medical College of Virginia; the National Cemetery, two miles to the northeast of the city; the Sheltering Arms Hospital, and Idlewood Park, a favorite summer-resort, close to the city on the west.

Hollywood Cemetery is the most interesting of the cemeteries. Near the west gate of the cemetery is the Confederate Monument, a rude pyramid of stone ninety feet high, erected as a memorial to the sixteen thousand Confederate soldiers buried here. On President's Hill, in the southwest corner of the cemetery, overlooking the river, are the graves of Monroe and Tyler, two of the seven presidents born in Virginia. John Randolph, Jefferson Davis, General Pickett, General J. E. B. Stuart and Commodore Maury are also buried here. Patrick Henry is buried in St. John's Churchyard.

During the last three years of the Civil War (1862-1865) battles raged all round Richmond, and remains of the fortified lines constructed to protect the city are visible in various parts of the environs.

The leading industry is the manufacture of tobacco. Other important products are lumber and planing-mill supplies, foundry and machine-shop products (including locomotives), fancy and paper boxes, packing boxes, saddlery and harness, carriages and wagons, confectionery, flavoring extracts, patent medicines and compounds, etc. There are also large railroad repair shops, establishments for grinding and roasting coffee, etc. Richmond was formerly noted as a center of the flour-milling industry.

Richmond was settled in 1733 and incorporated in 1742. Captain John Smith's settlement of "None Such" in 1609 and Fort Charles, erected in 1645, were both near the site of the present city. In 1779 it became the capital of the state. During the American Revolution the place was taken by a British force under Benedict Arnold, January 5, 1781, and the warehouses and public buildings were burned. The following year the city was chartered. Richmond, as the capital of the Confederacy, was the main objective of Federal

operations during the Civil War. It was evacuated April 2, 1865. The warehouses and a considerable part of the business section of the city were burned by the Confederates.

Salt Lake City, Utah. [The "City of the Saints;" named for the famous lake of that state.]

It is the chief town and ecclesiastical capital of the State of Utah, and is situated on the river Jordan, eleven miles from Great Salt Lake. It is built at the base of the Wasatch Mountains, four thousand three hundred and thirty-four feet above sea-level. The valley is world-famed for its beauty, resources, climate, and health-giving properties. By rail it is thirty-six miles south of Ogden, on the Union Pacific Railroad; eight hundred and thirty-three miles from San Francisco, and one thousand and thirty-one miles from Omaha.

The city is regularly laid out and the streets are wide and shaded with trees. Each house in the residence quarters stands in its own garden.

Temple Block, "the sacred square of the Mormons," covering ten acres, is the center of the city. Here are the Great Temple, and the Tabernacle, the latter one hundred and fifty by two hundred and fifty feet, with a self-supporting roof shaped like a tortoise shell, supported by forty-four sandstone pillars, and having a seating capacity of eight thousand, accommodations for twelve thousand, and one of the finest pipe organs in America.

A little to the east of the Tabernacle is the Temple, a large and handsome building of granite, erected at a cost of over four million dollars. At each end are three pointed towers, the loftiest of which, in the center of the east or principal facade, is two hundred and ten feet high and is surmounted by a colossal gilded figure (twelve and one-half feet high) of the Angel Moroni, by C. E. Dallin. The interior is elaborately fitted up and artistically adorned.

The Assembly Hall, to the south of the Tabernacle, is a granite building with accommodation for three thousand people, intended for divine service.

At the corner of North Temple and Main Streets stands the Latter-Day Saints University. At the southeast corner of Temple Square is the Pioneer Monument, surmounted by a copper statue of Brigham Young, which was unveiled in 1897.

On South Temple Street towards the east is the Deseret News Block, a large brown-stone building where the oldest newspaper to the west of the Missouri is published. To the left are the Tithing Office and Tithing Storehouse where the Mormons pay their tithes in kind. A little farther on, also to the left, are the Lion House, one of the residences of Brigham Young; the office of the president of the Mormon Church; and the Beehive House, another of Brigham Young's houses. On the opposite side of the street are the huge shoe-factory and warehouse of Zion's Coöperative Mercantile Institution; the office of the Juvenile Instructor; the office of the Historian of the Mormon Church; and the Gardo House, or Amelia Palace, opposite the Beehive House.

A little farther to the northeast, through the Eagle Gate, is Brigham Young's grave, surrounded by an ornamental iron railing.

The imposing City and County Building is in Washington Square, and the Federal Building is in Main Street, between Third and Fourth South Streets. A new Capitol is in contemplation in Capitol grounds, near Prospect Hill. Among the educational establishments are the Utah State University, to the east of the city, near Fort Douglas, and the High School, in Union Square. The Roman Catholic Cathedral and several other religious edifices also are represented, including Presbyterian, Congregationalist, and Methodist churches. St. Mark's Cathedral is a handsome building. Other noteworthy edifices are those of the museum, the Mining Institute, St. Mary's Hospital, the University of Utah, and the theaters and opera house.

The city is more important as a trading center than for manufactures. The leading industries are beet-sugar refining, smelting, salt making, and the manufacture of boots and shoes, glass, woolens, paper, cutlery, pottery, etc. A large business is done in bullion and mining stocks. The city has a large jobbing trade, being the distributing center for an immense mining agricultural and stock raising region in Utah. West Wyoming, South Idaho, and East Nevada.

Salt Lake City was founded in 1847 by Brigham Young and incorporated in 1851. Until 1870 it was almost wholly a Mormon city.

San Antonio (*săn ăn-to'nĭ-ō*), **Texas.** [Named for the Roman Catholic mission, San Antonio de Valero, otherwise the Alamo.]

After Dallas it is the largest city in the state, and is located on the San Antonio River, two hundred and ten miles by railroad west of Houston, one hundred and eighty-eight miles west of Galveston, on both banks of the San Antonio Creek, at the mouth of San Pedro River. Built on a level plateau, with an elevation of six hundred and sixty feet above the sea, it includes the old Mexican town of San Fernando, west of San Pedro Creek, inhabited chiefly by Americans and largely rebuilt since 1860. The San Antonio River winds for thirteen miles through the city, and San Pedro Creek for ten miles. These are spanned by numerous little bridges. It is one of the most interesting in the United States.

The first object of interest in San Antonio is the Church of the Mission del Alamo, situated in the Alamo Plaza, in the quarter to the east of the San Antonio River. The church, which seems to have derived its name from being built in a grove of alamo or cottonwood trees, is a low and strong structure of adobe, with very thick walls. It was built in 1744, but has lost many of its original features. It is now preserved as a national monument for its historical interests.

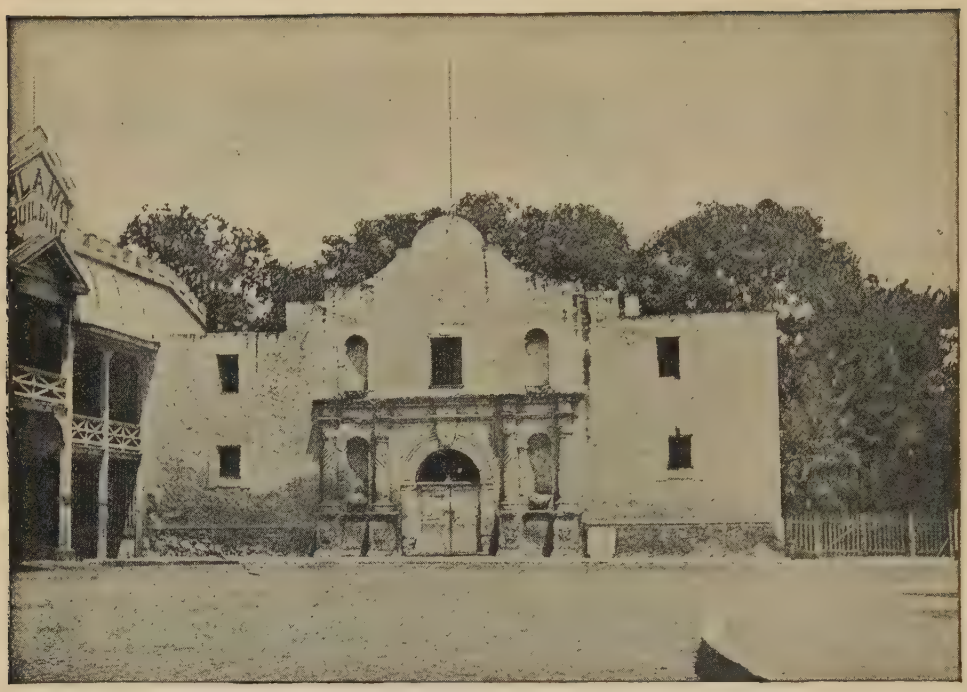
At the north end of the Alamo Plaza, in Houston Street, is the handsome Federal Building. On the west side of the plaza is the building containing the San Antonio Club and the Grand Opera House.

Houston Street towards the west crosses the San Antonio and reaches Soledad Street, which leads to the left to the Main Plaza (Plaza de Las Yslas), pleasantly laid out with gardens. On its south side rises the imposing Court House and on its west side stands the Cathedral of San Fernando, dating in its present form mainly from 1868 to 1873, but incorporating parts of the earlier building, where Santa Ana had his headquarters in 1836. To the west of the Cathedral is the Military Plaza (Plaza de Armas), with the City Hall.

The Military Post (Fort Sam Houston), on Government Hill, one mile to the north of the city, costing over two million dollars, is one of the largest in the United States and deserves a visit. The tower (eighty-eight feet high), in the center of the quadrangle, commands a splendid view of the city and its environs.

The old Spanish Missions near the city most often visited are the First and Second Missions, but, the Third and Fourth Missions have much interest also.

The Mission of the Conception, or First Mission, lies about two and a quarter miles to the south of the city (reached via Garden Street), dates from 1731 to 1752, and is well preserved. The church has two towers and a central dome. The Mission San Jose de Aguayo, or Second Mission, four miles to the south of the city, dates from 1720 to 1731 and is the most beautiful of all.



OLD SPANISH CHURCH OF THE ALAMO, SAN ANTONIO, TEXAS

During the war of Texan independence, the Alamo, then converted into a fort, was the scene of an extraordinary conflict, the fort being held by Colonel David Crockett and Colonel James Bowie. Though almost continually assailed from February 23 to March 6, 1836, it only yielded when the defenders were all slain but five; these were captured by the Mexicans and cruelly slain. "Remember the Alamo," thereafter became a war cry, and the place itself has been called the "Thermopylæ of America."

Among the educational institutions are St. Louis College (Roman Catholic), St. Mary's Hall, St. Mary's College, Wolfe Memorial School, and the Ursuline Convent and School.

San Antonio is the natural trading center for an immense area, its jobbing houses have an extensive trade in Mexico as well as in Texas. The industrial establishments are machine shops, foundries, breweries, flour mills, binderies, cotton presses, ice plants, tanneries, marble works, cement works, and manufactories of brooms, carriages and wagons, candy, soda and mineral waters, mattresses, bricks and tiles. It is a leading cattle, horse, and mule market, ships large quantities of cotton, wool, and hides; and is the financial center of the largest stock raising interests of the Southwest. The surrounding district, irrigated by water, obtained from deep artesian wells, is extensively engaged in truck farming for Northern markets.

Although the Spaniards built a fort at San Antonio in 1689, its real settlement began in 1714. In 1718 the Franciscan mission of San Antonio de Valero was founded, and, about 1722, on another site was built the Alamo, the "cradle of Texans' liberty," in which in 1836 a garrison of about one hundred and eighty men, among them Davy Crockett and James Bowie, for eleven days resisted General Santa Ana's Mexican army, numbering thousands of men. Eight battles for independence were fought in or near San Antonio between 1776 and 1836, successively under Spanish, French, Mexican, and Texan flags. It received a city charter in 1873.

San Francisco, Cal. [The "City of the Golden Gate"; said by some to have been named for the old Spanish mission of San Francisco de Assisi, by others to have been named for the founder of the order to which Father Junipero, the discoverer of the bay, belonged.]

It is grandly situated at the north end of a peninsula thirty miles long, separating the Pacific Ocean from San Francisco Bay, two thousand four hundred and thirty-four miles west of St. Louis, and three thousand four hundred and fifty-two miles from New York. The city lies mainly on the shore of the bay and on the steep hills rising from it, but is gradually extending across the peninsula (here six miles wide) to the ocean. On the north it is bounded by the famous Golden Gate, the narrow entrance (one mile across and about five miles long) to San Francisco Bay. The commercial part of the town is fairly level and lies along the bay. The chief business thoroughfare is Market Street, three and one-half miles long, with which the streets from the north and west hills intersect. This feature gives the city a striking skyline.

San Francisco Bay, a noble sheet of water, gives San Francisco one of the finest harbors in the world and affords numerous charming excursions. It gives the city much of its commercial importance, also, and extends from Fort Point past the city in a southerly direction for about fifty miles, varying in width from six to twelve miles. Northward this bay connects by a strait with San Pablo Bay, ten miles in length, having at its northerly end Mare Island and the United States Navy Yard.

Across the bay are Oakland, Alameda, and Berkeley.

In 1906 a large part of the city was destroyed by earthquake and fire, the estimated loss reaching over three hundred million dollars. The business district has since been largely rebuilt, and many costly buildings of marble, granite, and

NIGHT VIEW, SHOWING ILLUMINATION OF SOUTH GARDENS AND MAIN ENTRANCE, PANAMA-PACIFIC INTERNATIONAL EXPOSITION, SAN FRANCISCO, 1915

The Panama-Pacific International Exposition at San Francisco was open from February 20 to December 4, 1915. The total attendance was 18,871,957. The last day made the record, 458,558 persons having passed through the turnstiles. The Fine Arts Palace remained open until May 1, 1916.

terra cotta, and iron and steel-framed "skyscrapers" have been constructed. Before the earthquake of 1906 the most conspicuous public buildings were the City Hall, erected at a cost of six million dollars, and which occupied twenty-five years in building; the Post Office, completed at a total cost of five million dollars; the Hall of Justice, the Custom House, a Mint and a Subtreasury; the building of the Society of California Pioneers, and stock and merchants' exchanges; and the Ferry Building containing a display of the mineral resources of California.

Market Street, the chief business thoroughfare, extends to the southwest from the Union Ferry Depot, a handsome structure, with a tower two hundred and fifty feet high, to a point near the twin Mission Peaks, a distance of about three and one-half miles.

Following Market Street towards the southwest, at the intersection with Battery Street is the Labor Monument, a vigorous bronze group dedicated to the memory of Peter Donahue of the Union Iron Works. At the southwest corner of Market and Montgomery Streets stands the Palace Hotel, opposite which is the Union Trust Building, the first of the buildings whose steel and concrete frame withstood the fire. Close by, at the corner of Montgomery and Post Streets, are the Crocker Building, another survivor, and the new stone structure of the First National Bank.

At the corners of Kearney and Third Streets rise the Chronicle Building and the tall Spreckels or Call Building, the top of either of which affords a good bird's-eye view of the city.

Market Street, towards the southwest from the Chronicle Building, contains many large office buildings, including the tall Humboldt Savings Building. At the corner of Fourth Street is the Pacific Building, a huge structure of re-enforced concrete, with a facade of green and brown tiles. In the same block is the Emporium, which has been rehabilitated since the disaster of 1906. On the right, at the corner of Powell Street, is the large Flood Building, another survivor of the fire. It is chiefly occupied by railway offices.

Powell Street leads to Union Square, with the St. Francis Hotel and a Naval Monument commemorating the exploits of the United States fleet in the Philippines during the war with Spain (1898).

At the junction of Market Street with Mason Street is a monument commemorating the admission of California to the Union (1850). To the left, at the corner of Seventh Street, we catch a glimpse of the long frontage of the Post Office with its fine granite carvings. Just beyond this corner, in a small triangular park, is the large Californian Monument, presented to the city by James Lick. The stately monument erected in honor of the achievements of the navy in the Spanish-American war remains uninjured.

The district containing the United States Appraisers Stores and the large new Custom House was spared by the great fire.

The United States Branch Mint, in Fifth Street, at the corner of Mission Street, contains interesting machinery and a collection of coins and relics. The effect of the fire may be clearly seen on the granite at the north end of the building.

Montgomery Street and the southern part of Sansome Street, form the center of the banking district. On the former is the Union Trust Building, and a series of large office buildings, of which the most important are the Mills Building, corner of Montgomery and Bush Streets; the Merchants Exchange, California Street, near Montgomery Street; Kohl Building, corner Montgomery and California Streets; Italian-American Bank, a one-story building with Doric columns, corner Montgomery and Sacramento Streets; and the Bank of Italy, corner Montgomery and Clay Streets. At the northeast corner of Sansome and California Streets rises the tall Alaska Commercial Building, with the handsome Bank of California opposite.

Nob Hill was the name given about 1870 to that section of California Street, between Powell Street and Leavenworth Street, containing many of the largest private residences in San Francisco. Most of these were of wood, and no expense was spared to make them luxurious dwellings, but with unfortunate architectural results. Few relics of these are now extant. The hill is crowned by the huge Fairmont Hotel, opposite which is the Hopkins Institute of Art.

The present fashionable residential quarter is on

Pacific Heights, including the western parts of Jackson Street, Washington Street, Pacific Avenue, and Central Avenue.

The educational institutions of San Francisco, include the Academy of Sciences, endowed by James Lick; the Hopkins Art Academy, situated on Nob Hill; Memorial Museum, in Golden Gate Park; Mechanics' Institute, which contains property valued at two million dollars, and a library of seventy thousand volumes. Other fine libraries are the Sutro library of two hundred thousand volumes, the public library of one hundred thousand volumes, while the California Historical Society, San Francisco Medical Society, the San Francisco Law Library; the French and Mercantile libraries all have collections of more than thirty thousand volumes. The California School of Mechanical Arts, Cooper Medical College, Cogswell Polytechnic School, College of Notre Dame, Sacred Heart Academy, Irving Institute, the medical and law faculties of the University of California, are also located here.

The city was always conspicuous for its fine churches. The most prominent of these were the Roman Catholic Cathedral, the Jesuit Church of St. Ignatius, and the Mission Dolores, a survival of Spanish occupation.

The largest of the city parks is Golden Gate Park, covering more than one thousand acres and redeemed from a waste of sand-dunes, now one of the most beautiful in the country. It extends from Stanryan Street to the Pacific Ocean, a distance of three miles. Its fine trees and shrubbery, semi-tropical plants and flowers, artificial lakes and Japanese tea gardens combine to make it a veritable wonderland. Through the park a broad, smooth, and well-kept speedway runs out to the ocean beach, and the famous old Cliff House, the Sutro Heights, on the hills of the west or ocean side, from which is a magnificent view of the Seal Rocks and Pacific Ocean.

To the north of the park, beyond the intervening Richmond district, lies the Presidio, the United States military reservation. Here are the harbor fortifications with their big and powerful rapid fire machine guns, the officers' quarters with picturesque gardens and hedgerows, and the hospital and barracks for the soldiers, while down at the water's edge is old Fort Mason, a circular brick structure now used as a storehouse.

The population is very heterogeneous, every European nationality being represented here, to say nothing of the Mexicans, Chinese, Japanese, Negroes (relatively few), Filipinos, Hawaiians, and other non-European races.

The Chinese Quarter, rebuilt since the fire, is still one of the most interesting and characteristic features of San Francisco. It lies, roughly defined, between Stockton, Sacramento, Kearney, and Pacific Streets, and now consists mainly of large modern store buildings in a modified Oriental style, and of tall tenements, swarming with Chinese occupants. Chinatown contains about ten thousand inhabitants.

To the north of Chinatown, spreading about the base of Telegraph Hill, is the so-named Latin Quarter, peopled by Italians, Greeks and Mexicans. Their houses, shops, and restaurants are most characteristic. The Japanese Quarter is bounded by Van Ness, Fillmore, Geary, and Pine Streets.

In the pretty park that separates busy Kearney Street from Chinatown, the beautiful golden galleon monument to Robert Louis Stevenson still stands.

San Francisco as the western terminus of the great continental railroads and of many short lines, has important steamship communication with the ports of the world. The bay is accessible to the largest vessels. It is one of the most important grain ports in the United States; and gold and silver, wine, fruit, and wool are exported. There are large sugar refineries, foundries, shipyards, cordage works, wood factories, woolen mills, and many others.

A Spanish post and mission station were established on the site of San Francisco in 1776. The mission was secularized in 1834, and a town was laid out in 1835. A United States man-of-war took possession of it in 1846, and it became an important place in 1849 on account of the discovery of gold (1848). It was devastated by fires, 1849-1851. In 1850 it was incorporated as a city. The original name of the place was Yerba Buena (Spanish, "good herb"). It was changed to San Francisco in 1847. In 1869 railway connection was established with the eastern United States. In 1877 Denis Kearney began a violent agitation against the competition of Chinese labor. This was known as the "sand lots" movement, from the name of the place where the meetings were held. On April 18, 1906, the city was visited with a severe shock of earthquake, and the resultant fires destroyed much of the business section and one-third of the residence portion of the city.

Berkeley, across the Bay from San Francisco, is the seat of the Colleges of Letters and Science of the University of California. The University, founded in 1868, has played a very important part in the educational development of California and of the Pacific Slope. Its other departments are at San Francisco and the Lick Observatory, with the great telescope, is at Mt. Hamilton.

A number of the buildings at Berkeley are handsome, and the picturesque grounds, two hundred and fifty acres in extent, command a splendid view of the Golden Gate and San Francisco. The very interesting open-air Greek Theater, built in 1903 on the general type of the theater at Epidaurus, accommodates twelve thousand spectators and is used for university meetings, commencement exercises, and concerts. The museums, the library, and the laboratories are admirably adapted to their uses.

At Palo Alto, thirty-four miles south of San Francisco, one mile from the station is the Leland Stanford, Jr., University, founded by Mr. and Mrs. Leland Stanford in memory of their only son and endowed by them with upwards of thirty million dollars. The buildings were mainly designed by H. H. Richardson, who took the motif of their architecture from the cloisters of the San Antonio Mission. The material is buff, rough-faced sandstone, surmounted by red-tiled roofs, producing brilliant effects of color in conjunction with the live oak, white oak, and eucalyptus trees outside, and tropical plants in the quadrangle, and the blue sky overhead. In the earthquake of 1906 the buildings suffered severely, the damage done being estimated at nearly two million dollars. Much, however, has been restored or rebuilt. The buildings include a low quadrangle, enclosing a court five hundred and eighty-six feet long and two hundred and forty-six feet wide, with a beautiful colonnade on the inner side; an outer, two-storied quadrangle, with cloisters on the outside; a Chapel; various dormitories; an Art Museum; a mechanical department; and a village of professors' houses.

Seattle (*sē-ăt'ĭ'l*), **Wash.** [Named for the chief of the Duwamish tribe of Indians, *See-aa-thl.*]

It is finely situated on Elliot Bay, an arm of Puget Sound, one thousand eight hundred and twenty-eight miles from St. Paul. It occupies a series of terraces rising from the shore of the Sound, with steep hills rising from the water, the heights commanding superb views of the snow-crowned Olympic Mountains and the Cascades, including Mounts Rainier and Baker.

The residence streets run up the slope of a hill, with the business portion built on the level ground at the foot, stretching along the excellent harbor, with its many wharves.

Among the finest edifices are the Roman

Catholic Cathedral, the Union or King Street Passenger Station, with Carnegie Library, the American Bank, and the Alaska, Lowman, White, Central, and Empire Buildings.

Its notable buildings include, also, the County Court House, County Almshouse, Opera House, High School, and Hospital. The city is beautified with monuments and statues, unique among which is the Totem Pole, in Pioneer Square, near the Union Station, which was brought from Alaska and is one of the best examples of its kind. There is a good statue of Wm. H. Seward, by Richard Brooks, and in the campus of the University of Washington is a colossal statue of Washington, by Lorado Taft.

The University has grounds three hundred and fifty-five acres in extent, and furnished the site for the Alaska-Yukon-Pacific Exposition of 1909.

Other leading educational institutions are Seattle Seminary (Methodist), Seattle Female College, College of the Immaculate Conception and Academy of the Holy Name (both Roman Catholic).

There are several fine parks connected, together with the lakes, by a system of boulevards. Fort Lawton, a military post, is within the city limits.

The harbor, which is in Lake Washington and is four miles long and two miles wide, admits the largest vessels at all times. As the terminal of two transcontinental railroads and as an oceanic seaport, Seattle has extraordinary commercial advantages. It has direct steamship lines to Japan, China, the Philippines, and to Honolulu, and is also connected with European and South American ports. It is the chief outfitting port for the Yukon and Alaskan gold fields, and the chief trading center for the numerous ports on the extensive coast-line of Puget Sound. It has abundant electric power generated by falls in the rivers of the Cascades at a very low cost. Snoqualnite Falls, nineteen miles distant, are one hundred and twenty-six feet higher than Niagara, and supply an immense power.

Seattle largely owes its phenomenal growth to the lumber trade. The manufactures include beside, flour, iron and steel products, boots and shoes, beer, etc. Other industries are bridge-works, shipyards, meat-packing, and fish-canning. The city has also smelting and refining works, and a United States assay office. The chief exports are lumber, coal, meats, fruits, wheat, and hops.

Seattle was first settled in 1852. The place was laid out in 1853 and was incorporated in 1865 as a town and in 1880 as a city. In 1889 it was almost wiped out by fire, but one business building escaping destruction. From June 1 to November 30, 1909, the Alaska-Yukon-Pacific Exposition was held here, the average daily attendance being twenty-eight thousand. In the spring of 1910 a Municipal Plans Commission of twenty-one members was created by an amendment to the city charter of Seattle, and in 1911 their report was issued containing sketches and plans illustrating their proposals for the beautification and future growth of the city.

St. Louis (*sānt lōō'ĭs* or *lōō'ĭ*), **Mo.** [Named in honor of Louis XV. of France; the name originally applied to a depot established at this point February 15, 1764, by Pierre Láclede Liguest.]

It is the principal city of Missouri, and is located on the west bank of the Mississippi River, twenty-one miles south of the mouth of the Missouri River, and by rail one thousand one hundred and eight miles southwest of New York, two thousand four hundred and thirty-four miles east of San Francisco, and six hundred and ninety-six miles north of New Orleans. It has a frontage of nearly twenty miles on the river and rises from it in three terraces, the third of which is about two hundred feet above the river level.

The city is regularly laid out, on the Philadelphia plan, Market Street running east and west, being the dividing line between north and south. The streets running north and south are numbered, though many of them are also known by names. Broadway or Fifth Street is the chief shopping thoroughfare, while other important business streets are Fourth Street, Olive Street, Washington Avenue, Third Street, and First Street (or Main) and Second Streets. The city is also divided into a north and south section by the valley of Mill Creek (now filled in), which is spanned by seven bridges. The city has recently extended greatly to the west, and commerce is steadily encroaching on the residential quarters.

The Court House, in Broadway, between Market and Chestnut Streets, is a substantial building in the form of a Greek Cross. It is surmounted by a dome, one hundred and seventy-five feet high, the gallery of which commands an excellent view of the city and river. A little to the east, in Third Street, corner of Chestnut Street, is the Merchants' Exchange, the main hall of which, with a painted ceiling, is two hundred and twenty feet long. The grand ball of the Veiled Prophet is held here. The Cotton Exchange is at the corner of Main and Walnut Streets.

By following Market Street to the west from the Court House, the square, named Washington Park, is reached, and also the City Hall. A little to the south, in the square enclosed by Clark Avenue and Spruce, Eleventh and Twelfth Streets, are the so-called Four Courts, built on the model of the Louvre, in Paris, with a large semi-circular jail at the back. A little to the north of the City Hall runs the busy Olive Street, which toward Broadway, passes the Post Office on the left. Among the numerous substantial business buildings in this part of Olive Street are the Star, Century, Frisco, Chemical, Missouri Trust, Commercial, Laclede, Commonwealth Trust, National Bank of Commerce, and Third National Bank, a large and very fine structure. In Broadway, at the corner of Locust Street, is the Mercantile Library, which contains one hundred and fifty thousand volumes, statues by Harriet Hosmer, and others.

Other important buildings in this business section of the city are the Security Building (at the southwest corner of Fourth and Locust Streets); the Mercantile Trust Co., at the northeast corner of Eighth and Locust Streets (with vaults closed by a circular steel door of marvelous mechanism weighing four and one-half tons); the St. Louis Union Trust Co., at the northwest corner of Fourth and Locust Streets; the Mercantile Club, southeast corner of Seventh and Locust Streets; the Public Library, Locust Street, corner of Ninth Street; the Lincoln Trust and Wainwright Buildings, corner of Seventh and Chestnut Streets; and the Missouri Pacific Building, northwest corner of Market and Seventh Streets.

On the block between Thirteenth, Fourteenth, Olive and St. Charles Streets is the new Carnegie Central Library, erected at a cost of one million dollars.

At the corner of Locust and Nineteenth Streets is the handsome School of Fine Arts, which is connected with Washington University.

The Episcopal Cathedral, the Roman Catholic Cathedral, old and new, and many of the new Protestant churches in the West End are architecturally striking.

The parks of St. Louis are among the most notable in the United States, and their area (two thousand three hundred acres) is exceeded by those of Philadelphia alone. The finest are Forest Park (one thousand three hundred and seventy acres); Tower Grove Park (two hundred and sixty-six acres); Carondelet Park, O'Fallon Park, and the Missouri Botanical Garden, which is one of the foremost in North America.

To the west of Forest Park is the new home of Washington University, forming one of the most

successful and appropriate groups of collegiate buildings in the New World. They were designed by Messrs. Cope & Stewardson in a Tudor-Gothic style and enclose several quadrangles. The material is red Missouri granite. Among the buildings already completed are University Hall, the Chemical and Physical Laboratories, the Architectural and Engineering Buildings, the Chapel (resembling King's College Chapel at Cambridge, England), the library (with a fine reading room), various dormitories, and the gymnasium. The university grounds are one hundred and ten acres in extent.

The other institutions of higher education are St. Louis University, the College of the Christian Brothers, Maria Consilia Convent, training school for nurses, several medical colleges, dental college, the theological seminaries, manual training school, the State School for the Blind, and the St. Louis Day School for Deaf Mutes.

In Forest Park, not far from the University, is the handsome Museum of Fine Arts, originally erected as the Fine Arts Building of the Louisiana Purchase Exposition. In front of the entrance is a colossal equestrian bronze statue of St. Louis.

The great St. Louis or Eads Bridge, across the Mississippi, is deservedly one of the monuments of the city. It was designed by Capt. James B. Eads and was constructed in 1869-1874 at a cost of ten million dollars. It consists of three steel spans (center five hundred and twenty feet, others five hundred and two feet each) resting on massive limestone piers. The total length is two thousand and seventy yards. The bridge is built in two stories, the lower for the railway, the upper for the roadway and foot passengers. Trains enter the lower track by a tunnel, one thousand six hundred and thirty yards long, beginning near the corner of Twelfth and Cerre Streets. The highest part of the arches is fifty-five feet above the water.

The Merchants' Bridge, three miles farther up the river, is a steel truss bridge, and was built in 1889-1890, at a cost of three million dollars. It is used by railways only. It has three spans, each five hundred feet long and seventy feet high.

St. Louis ranks fourth among the manufacturing cities of the United States. It is the largest tobacco manufacturing city in the world, and also has a large production of malt liquors, flour, boots and shoes, hardware, stoves, railways and electric cars, woodenware, brick, biscuit, crackers, etc. The city is also the largest mule mart in the world, and noted as a drug market.

Founded from New Orleans in 1764, by Pierre Làclede-Liguest and Auguste Chouteau, St. Louis remained a fur-trading post until the Louisiana Purchase of 1803. Its first era of marked development began with the arrival of the first steamboat, 1817. Steam navigation of its river connection made it the most important point in the settlement of the trans-Mississippi West. It had repeatedly doubled its population before the first period of German immigration, following the German revolution of 1848. In 1875 St. Louis was separated from the County of St. Louis and given an independent government of its own. In 1896 the city was swept by a destructive tornado. In 1903 an exposition was held in St. Louis to celebrate the Louisiana Purchase.

Its population of American birth heavily predominates, but its German population is large and every element of European population is represented, with a recent increase from Southern Europe and Russia in excess of all other elements.

St. Paul, Minn. [Named from the Chapel of St. Paul, a log chapel erected here by Roman Catholics. Indian name, *imnijaska*, "white rock," a reference to the sandstone bluff on which the city stands.]

It is the capital of Minnesota, and located on both banks of the Mississippi River, immediately below Minneapolis, the suburbs of the "Twin Cities" being contiguous.

It has a picturesque site at an elevation of six hundred and seventy to eight hundred and eighty feet above sea level on a series of terraces, the highest of which is two hundred and sixty-six feet above the river. The two divisions of the city are connected by three municipal bridges. In addition to these there are a number of railway bridges and scores of smaller bridges over ravines, valleys, railway crossings, etc. The municipal limits include the suburbs of Merriam, St. Anthony, Union, Groveland, Macalester, and Desnoyer Parks, Arlington Hills, and others.

Of the three plateaus, the first contains the railway yards, Union Station, wholesale houses and factories. Above the flats are the business section and part of the residential district; still higher are the bluffs, the most fashionable residential quarter, with extensive views of the river and the lower terraces.

The business part of the town is well built and regularly laid out, and the suburban quarters contain many fine streets and handsome residences.

The new State Capitol, erected in 1898-1906, at a cost of four million five hundred thousand dollars, is a large and handsome edifice of granite and Georgia marble, with an unusually successful central dome.

The most impressive parts of the interior are the central rotunda, the two great staircases, the Supreme Court, and the Senate Chamber. The dominant note in the color scheme is furnished by Minnesota yellow limestone. The mural paintings are by La Farge, Simmons, Blashfield, Garnsey, Kenyon Cox, and H. O. Walker. In the Governor's reception room are paintings by F. P. Millet, Howard Pyle, Douglas Volk, and others. The State Law Library and that of the State Historical Society are both housed in the Capitol.

Four blocks to the south of the Old Capitol are the Custom House and the City Hall, the latter a handsome building erected at a cost of one million dollars. Among other important buildings in the business quarter are the Public Library; the Auditorium, a hall for meetings and theatrical performances; the new Y. M. C. A. Building; the New York Life Insurance Building, corner Sixth and Minnesota Streets; the Roman Catholic Cathedral of St. Paul, Sixth Street, corner of St. Peter Street; the High School, corner Tenth and Minnesota Streets; the Globe Building, Fourth Street, corner Cedar Street; the Germania Life Insurance Office; the former Bank of Minnesota, now used for various offices; the Manhattan Building, corner of Fifth and Robert Streets; the Gilfillan Building; the Endicott Arcade; the Central Presbyterian Church; the Bethel Hotel, resembling the Mills House of New York; the Minnesota Club House; the People's Church; the Field, Mahler & Co. Building, Fourth Street; and the Great Northern and the Northern Pacific Railway Offices.

The finest residence street is Summit Avenue. It begins at Wabasha Street and runs from Summit Park along a high ridge. The most prominent dwelling is the large brown stone mansion of the late James J. Hill, containing a good collection of paintings by Corot, Delacroix, Courbet, Troyon, Decamps, etc.

A Roman Catholic Cathedral is being erected at Summit Park; and to the west of the town, near the west end of Summit Avenue, by the river, is the extensive Roman Catholic Seminary of St. Thomas Aquinas. On the bluff above, at the end of Grand Avenue (parallel to Summit Avenue) are the various buildings of the Hill Seminary.

It is also the seat of Hamline University (Methodist Episcopal), Concordia College (Lutheran), Macalester College (Presbyterian), several medical colleges, a State Reform School, and an Academy of Natural Sciences.

WASHINGTON, AMERICA'S CITY BEAUTIFUL

1. THE CAPITOL
2. MEMORIAL TO LINCOLN
3. THE WHITE HOUSE (SOUTH FRONT)
4. LIBRARY OF CONGRESS

St. Paul has a park system of remarkable beauty. Como and Phalen Parks have picturesque lakes, and Indian Mound Park is said to have views unsurpassed anywhere else on the Mississippi River. Harriet Island, in the river opposite the business district, is provided with public baths. There are twenty-two miles of park and boulevard driveways, not including the River Boulevard. The total park area is one thousand two hundred and four acres. Fort Snelling, attractively located at the mouth of the Minnesota River, occupies a large tract adjacent to the city on the southwest.

The manufactures of St. Paul include machinery, farming implements, furniture, carriages, boots and shoes, and malt liquors. Here also are located the extensive meat packing plants of Swift & Co., and quarries of fine limestone. It is the center of the wholesale grocery and dry-goods business in Minnesota. It is also an important printing and publishing center, and has large car shops, lumber and planing mills, and breweries.

In 1841 Father Galtier, a French Canadian, induced the settlers, chiefly French Catholic hunters and traders in furs and whiskey, to build a log church which was dedicated to St. Paul. In 1849 the town became the capital of the newly organized territory of Minnesota, and was incorporated. It received its city charter in 1854.

Washington, D. C. [The "City of Magnificent Distances," from its being laid out on a large and regular scale; originally named Georgetown, but when selected in 1790 as the Federal Capital was re-named Washington in honor of the first President of the United States.]

The City of Washington, the Capital of the United States, lies on the left bank of the Potomac River, in the District of Columbia, one hundred and fifty-six miles from Chesapeake Bay, one hundred and eighty-five miles from the Atlantic Ocean, two hundred and twenty-six miles southwest of New York, one hundred and thirty-six miles of Philadelphia, and forty miles of Baltimore.

The city lies on a plain with slight elevations and surrounded by hills, and is generally accepted as the most beautiful in the United States, being finely laid out, with wide asphalted streets, opening up vistas of handsome public buildings, monuments, or leafy squares, with the Capitol and the Washington Monument dominating the entire view.

The original plan of Washington City was made by L'Enfant, a French engineer, who had adopted America as his residence. Based largely upon the topography of Versailles, its characteristic features are the crossing of the rectangular streets by frequent broad transverse avenues, one hundred and twenty to one hundred and sixty feet wide, lined with trees and named for various States of the Union. The streets running north and south are numbered, those running east and west are named by the letters of the alphabet. The circles formed by the intersection of the streets and avenues are one of the most charming features of the city.

Pennsylvania Avenue, between the Capitol and the White House (a distance of one and one-third miles), is the chief thoroughfare, and other important business streets are Seventh Street, Fourteenth Street, Ninth Street, and F Street. Among the finest residence streets are New Hampshire Avenue, Massachusetts Avenue, Vermont Avenue, Connecticut Avenue, and Sixteenth Street.

The new Union Railway Station, completed in 1908 at a cost of fifteen million dollars, including grounds and tunnels, is undoubtedly one of the most successful buildings in the country. It is situated at the junction of Massachusetts and Delaware Avenues, about one-third of a mile, and in full view of the Capitol. In front is a large plaza, embellished with shrubbery, fountains, and the finely sculptured Columbus monument.

The Capitol, splendidly situated on a hill ninety feet above the level of the Potomac, dominates the entire city with its soaring dome and ranks among the most beautiful buildings in the world. It stands in a park of about fifty acres, is seven hundred and fifty-one feet in length and one hundred and twenty-one to three hundred and twenty-four feet wide, and consists of a main edifice of sandstone, painted white, and of two wings of white marble. The building covers an area of three and one-half acres.

The cornerstone was laid by Washington in 1793. The main building, with its original low-crowned dome, was completed in 1827; the wings and the new iron dome were added in 1851-1865. The general style is classic, with Corinthian details. The principal facade looks towards the east, as the city was expected to spread in that direction, and the Capitol thus turns its back upon the main part of the city and on the other government buildings.

A fine marble terrace, eight hundred and eighty-four feet long, approached by two broad flights of steps, has been constructed on the west side of the Capitol and adds great dignity to this view of the building. The dome, which is two hundred and sixty-eight and one-half feet high, is surmounted by a figure of Liberty, nineteen and one-half feet high. The total cost of the building has been sixteen million dollars.

The front or east facade is preceded by three porticos, the main entrance being in the center. To the right of the central portico is the Settlement of America, a marble group by Greenough; to the left is the Discovery of America, a figure of Columbus by Persico. In the pediment above the portico is a relief of the Genius of America, by Persico; and in the pediment above the north portico is a group representing the Civilization of the United States, by Crawford.

The inauguration of the Presidents of the United States takes place on the broad steps in front of the main doorway.

In the interior beside the rotunda with its historical paintings, are the Senate Chamber in the north wing; the House of Representatives in the south wing, the Supreme Court in the central building, and the old Hall of Representatives, now used for historical statues.

To the north and south of the Capitol and connected with it by subways are the Senate and House of Representatives office buildings, two white marble edifices in a classic style, containing offices for senators and representatives.

To the southeast of the Capitol stands the Library of Congress, an enormous structure in the Italian renaissance style, four hundred and seventy feet long and three hundred and forty feet wide, erected in 1888-1897, at a cost of six million one hundred and eighty thousand dollars. It is in the form of a quadrangle, enclosing four courts and a central rotunda surmounted by a flat gilded dome and lantern. The main entrance, on the west side, is preceded by a broad flight of steps and a granite terrace, against the retaining wall of which is an effective fountain.

The interior of the Congressional Library is sumptuously adorned with paintings, sculptures, colored marbles, and gilding. To the right and left are massive marble staircases, richly adorned with sculptures and with bronze figures as lamp-bearers. The ceiling of the hall, seventy-two feet above the marble flooring, is resplendent in blue, green, and yellow.

The reading room rotunda is perhaps the finest and most thoroughly satisfactory part of the whole building. The chamber, which is one hundred feet in diameter and one hundred and twenty-five feet in height, accommodates about three hundred readers, is richly adorned

with dark marble from Tennessee, red marble from Numidia, and yellow marble from Siena. The eight massive piers are surmounted by symbolical female figures.

At the foot of the flights of steps descending from the terrace on the west side of the Capitol is an heroic statue of Chief Justice Marshall, by Story. The broad walk to the north leads to the Naval or Peace Monument, by Simmons. The walk to the south leads to the statue of President Garfield, by J. Q. A. Ward.

Diagonally to the southwest and northwest extend two grand avenues as far as eye can see—Maryland Avenue to the left leading down to the Potomac and carrying the line of the Pennsylvania Railroad to the river, where it crosses over the Long Bridge into Virginia; and Pennsylvania Avenue to the right stretching to the distant colonnade of the Treasury Building and the tree covered park south of the Executive Mansion. Between these diverging avenues and extending to the Potomac, more than a mile away, is the Mall, a broad inclosure of lawns and gardens. Upon it in the foreground is the government Botanical Garden, and behind this the spacious grounds surrounding the Smithsonian Institution; and the National Museum; while beyond, near the river bank, rises the tall, white shaft of the Washington Monument with its pointed apex; on either side spreads out the city, the houses bordering the foliage lined streets and having at frequent intervals the tall spires of churches and the massive marble, granite, and brick edifices that are used for government buildings.

The Smithsonian Institution is a red stone building in the late Norman style, erected in 1847-1856 at a cost of four hundred and fifty thousand dollars. The loftiest of the nine towers is one hundred and forty-five feet high. In front of it is a statue of Prof. Joseph Henry, the first secretary of the Institution, by Story.

New buildings for the National Museum, on the Mall between Ninth and Twelfth Streets, and the new one million five hundred thousand dollar marble building of the Department of Agriculture, west of the Smithsonian grounds, are notable. The former, originally established to exhibit the rich contributions given to the government by various countries from the Centennial at Philadelphia in 1876, has become a most extensive and instructive collection of antiquities, ethnology, geology, and natural history generally; and there are many museums, libraries and art galleries.

The Bureau of Engraving and Printing, where the paper money, bonds and stamps of the United States are printed, is at the corner of B Street and the Mall, southwest.

The national monument to Washington, popularly known as the "Washington Monument," is a towering obelisk of white marble, on the bank of the Potomac, erected at a cost of one million two hundred and thirty thousand dollars. It has a total height of five hundred and fifty-five feet, an area at the foundation of sixteen thousand feet, and a weight of thirty-six thousand nine hundred and twelve gross tons. The apex has an aluminum point, and there is an elevator and an iron stairway of nine hundred steps in the interior of the shaft.

From the Washington Monument the Treasury Department at Pennsylvania Avenue and Fifteenth Street comes into full view. It is an immense edifice, five hundred and ten feet long and two hundred and eighty feet wide, with an Ionic colonnade on the east front and porticos on the other three sides. The materials are freestone and granite, and it cost seven million dollars to erect the edifice. Among the chief objects of interest are the United States Cash Room, in the north corridor; the Redemption Division, in the basement; the Silver Vaults, containing bullion and coin to the value of hundreds of millions of dollars; and the Secret Service Division, with its collection of forged money and portraits of forgers.

On the south, opposite the Treasury, is the fine equestrian monument of General Sherman, by Rohl-Smith, erected in 1903. The pedestal is embellished with bronze reliefs, medallions, and figures of Indian women, and at the corners are four sentinels.

Following Pennsylvania Avenue towards the west, Lafayette Square, is approached. Here are bronze statues of General Andrew Jackson, by Clark Mills; the Rochambeau Monument, by F.

CORCORAN ART GALLERY, WASHINGTON

Hamar; and the Lafayette Monument, by Falguiére and Mercié. On the east side of the square is the Belasco Theater, occupying the site of the house in which an attempt was made to assassinate Secretary Seward in 1865.

Opposite Lafayette Square is the entrance to the White House or Executive Mansion of the President of the United States. The White House is a two-story stone building, painted white, one hundred and seventy feet long and eighty-six feet deep, with an Ionic portico. It was first built in 1792, occupied by President Adams in 1800, burned by the British in 1814, and rebuilt in 1818. In 1902-1903 the whole building was admirably restored, within and without. The esplanade or terrace on the west side connects the house with the new Executive Offices and Cabinet Room. The large East Room (eighty by forty by twenty-two feet) is open to the public from ten to two. The Reception Rooms, which contain portraits of Presidents and valuable gifts, and the handsome Dining Room are shown by special order only. The rest of the house is private. The grounds surrounding the house are seventy-five acres in extent.

To the west of the White House is the huge building of the State, War, and Navy Departments, enclosing two courts and measuring five hundred and sixty-seven feet in length by three hundred and forty-two feet in breadth. It is a granite building, in Renaissance style, the largest public edifice in Washington, covering four and one-half acres, has five hundred and sixty-six rooms, and cost eleven million dollars. The north and west wings are occupied by the war Department. The Navy Department is in the eastern part of the building.

ST. JOHN'S CHURCH, WASHINGTON

The Department of State occupies the southern part of the building. Among the finest rooms are the Diplomatic Reception Rooms, containing portraits of the Secretaries of State from 1789 to the present day, and the Library, with Jefferson's original draft of the Declaration of Independence and other relics.

In Seventeenth Street, to the southwest of the State Building, between New York Avenue and E Street, is the Corcoran Gallery of Art, built and endowed by the late W. W. Corcoran. The present building, erected in 1894-1897, is a handsome white marble structure in a Neo-Grecian style, by Ernest Flagg. The semicircular hall at the north end is used for occasional exhibitions, while the rest of this part of the building is occupied by a School of Art. The steps to the main entrance are flanked by colossal bronze lions, modeled after those by Canova at the tomb of Pope Clement XIII. The Gallery contains more than two hundred paintings, the finest collection of Baryé bronzes, Power's Greek Slave, and Vela's Dying Napoleon in marble.

Also in Seventeenth Street, south of the Corcoran Gallery, are the new Continental Hall, built by the Daughters of the American Revolution, and the new building of the International Bureau of the American Republics, erected at a cost of one million dollars by Andrew Carnegie.

The Interior Department occupies an entire square in the heart of the city, and is constructed of white marble in pure Doric, costing three million dollars. The General Land Office opposite is a Corinthian marble edifice.

In Judiciary Square on the north side stands the Pension Office, an enormous structure of brick, four hundred feet long and two hundred feet wide. It is surrounded by a terra cotta frieze illustrating military and naval operations. The interior, with its mammoth columns (seventy-five feet high), can accommodate about twenty thousand people at an inauguration ball, or other occasions.

Nearby, in B Street, is the large Census Bureau, in which a large staff is constantly at work. The enumerating machines are especially interesting.

To the northeast of this point, at the corner of North Capitol and H Streets, is the Government Printing Office, a twelve-story building erected at a cost of two million dollars.

Ford Theater, in which President Lincoln was assassinated by Booth on April 14, 1865, is in Tenth Street. A house opposite bears a tablet stating that Lincoln died there, and contains a collection of Lincoln relics.

On the south side of Pennsylvania Avenue, between Eleventh and Twelfth Streets, is the Post Office Department, with a tower three hundred feet high. At the corner of Pennsylvania Avenue and Fourteenth Streets is the new District or Municipal Building, a fine marble structure completed in 1908, and occupied by the District Commissioners and other officials of the local government.

At the intersection of Massachusetts Avenue and New York Avenue is Mt. Vernon Square, containing the Public Library, a white marble building, presented by Mr. Andrew Carnegie.

Beyond the Capitol to the southeast are the Washington Barracks, at the junction of the Potomac and its Eastern Branch, an artillery post, and the War College, a fine brick building, erected 1903-1908. In front of the latter is a statue of Frederick the Great by T. Uphues, presented to the United States by Emperor William II.

About one mile to the northeast, on the Anacostia River, is the Washington Navy Yard, with a museum, an important gun foundry, and manufactories of naval stores.

There are more than two hundred and fifty churches in Washington, of which the more important are St. John's (the "President's

Church"), and St. Thomas' Episcopal; the New York Avenue, and Church of the Covenant, Presbyterian; the Metropolitan and Foundry, Methodist; St. Matthew's and St. Aloysius', Roman Catholic; Calvary, Baptist; Garfield Memorial, Christian; and Mount St. Sepulchre, with its reproduction of the sacred places of the Holy Land.

The National Soldiers' Home, two miles above the city, founded in 1851, has six hundred acres of park and forest, which serve as a public driving park and rural resort. To the north lies the National Military Cemetery, with the graves of General Logan, General Kearney, and seven thousand soldiers. On the west this is adjoined by Rock Creek Cemetery, containing Saint-Gauden's beautiful monument to Mrs. Henry Adams. To the east of the Soldiers' Home Park is the important Catholic University of America, around which has grown up a somewhat remarkable group of ecclesiastical establishments, including a Franciscan Convent, houses of the Dominicans, Paulists and Marists, and Trinity College for young women. The university has a number of fine stone buildings of striking architectural effect. The other colleges of note are: George Washington University, with academic, scientific, graduate, medical, and technological departments, and a famous law school; Georgetown University, a Jesuit institution with academic and professional schools; American University, for graduate instruction only; and the National Deaf-Mute College, founded in 1864, a government institution for the education of deaf and dumb pupils from the army, the navy, and the District of Columbia. Its fine stone buildings lie just north of the city.

ARLINGTON HOUSE, HOME OF GENERAL ROBERT E. LEE

Among the more important private buildings may be mentioned those of the Washington Post and Evening Star, and the Munsey buildings, all on Pennsylvania Avenue; the Riggs National Bank, American Security and Trust Company, Washington Loan and Trust, Union Trust and Storage Company, and the National Metropolitan Bank. The larger office buildings are the Bond, the Colorado, the Ouray, the Southern, and Woodward buildings. The Masonic Temple, the Scottish Rite Temple, and the Y. M. C. A. buildings, are important structures.

More and more Washington is becoming the home of a class of wealthy Americans, many of whom have erected beautiful residences, and among those of conspicuous architectural value are the Leiter, Townsend, Walsh, McLean, Belmont, Hale, Anderson, Boardman, Patterson, Thomas Nelson Page, Wayne McVeagh, Henderson, and Gale houses. Of similar interest are the embassy buildings of the British, Chinese, French, Russian, and other nations. The Metropolitan, the Cosmos, the Army and Navy, University, National Press, and the Washington (for women) are the principal clubs, and have homes of their own.

An elaborate park system is in course of development, which will ultimately surround the city with parks and connecting boulevards. The principal park is Rock Creek Park, to the north of the city, containing two thousand acres extending along both sides of Rock Creek. Its natural beauties are very great. On Mt. St. Alban, near Woodley, to the northwest of Georgetown, is the Peace Cross, a large Celtic cross erected at the close of the war with Spain (1898) on the grounds of the new Episcopal Cathedral, of which the cornerstone was laid in 1907. It affords a fine view of Washington. On the Chevy Chase Road, to the northwest of the Zoölogical Park, are the National Bureau of Standards and the Geophysical Laboratory of the Carnegie Institution, the administration building of which latter is in Sixteenth Street.

South of Rock Creek Park, on Rock Creek, lies the National Zoölogical Park of one hundred and seventy acres, reached from Washington in a half hour.

On a commanding site overlooking Rock Creek, north of Georgetown, in handsome grounds, is the United States Naval Observatory, of white marble, with its twenty-six-inch equatorial telescope.

Scattered throughout the city are numerous squares, circles, and small parks, nearly all of which contain statues.

Of bronze statues erected in honor of famous men, Washington has an abundance—mainly to military characters. Equestrian statues of Washington, Jackson, Greene, Scott, Thomas, and McPherson are erected, besides full-length statues of Lafayette, Luther, Franklin, Chief Justice Marshall, Lincoln, Garfield, Professor Henry, Farragut, General Rawlins, and Admiral Dupont.

At Arlington, across the river from Washington, on commanding heights, is the National Cemetery containing the graves of about sixteen thousand soldiers. Arlington House, in the middle of the grounds, two hundred feet above the river, was once the residence of George Washington Parke Custis (step-grandson of Washington) and afterwards of General Robert Lee, who married Miss Custis. Near the house are the graves of General Sheridan, Admiral Porter, General Lawton, General Wheeler, and other distinguished officers.

To the south is a tomb containing the remains of two thousand one hundred and eleven unknown soldiers. The sailors destroyed by the blowing up of the "Maine" in 1898 and other victims

of the war with Spain are buried in the southern part of the cemetery.

The cornerstone of a splendid military memorial or Hall of Fame was laid here in 1916. to be erected in classic style, of marble, and to cost several millions of dollars.

MOUNT VERNON

MOUNT VERNON, Washington's home and burial place, is in Fairfax County, Va., about fifteen miles below the city. It is in full view, standing among the trees on the top of a bluff rising about two hundred feet above the river. As the steamboat approaches, its bell is tolled, this being the universal custom on nearing or passing Washington's tomb. The estate was originally a domain of about eight thousand acres, and Augustine Washington, dying in 1743, bequeathed it to Lawrence Washington, who, having served in the Spanish wars under Admiral Vernon, named it Mount Vernon in his honor. General Washington, in 1752, inherited Mount Vernon from Lawrence. After his death the estate passed to his nephew, Bushrod Washington, subsequently descending to other members of the family.

Congress repeatedly endeavored to have Washington's remains removed to the crypt under the rotunda of the Capitol, originally constructed for their reception, but the family always refused, knowing it was his desire to rest at Mount Vernon.

In 1856 the mansion and surrounding property were saved from the auctioneer's hammer, and secured as a national possession by the Ladies' Mount Vernon Association, assisted principally by Edward Everett, at a cost of two hundred thousand dollars.

Washington, originally called Federal City, was named after Washington in 1791, and became the capital in 1800. In 1814 the Capitol, White House, and other public buildings, were burned by the British.

WASHINGTON'S TOMB, MT. VERNON

LEADING EVENTS IN THE COLONIAL HISTORY OF THE

I. PERIOD OF AUTHENTIC DISCOVERY

Preceding this Period there are some legendary accounts of discoveries by Norsemen, Irish coverers, chief of which was Lief Ericsson and his brother Thorwald who came upon the mainland a new era, during which the Spaniards explored and settled the West Indies, Mexico, and the southern unsuccessful attempts at settlement in the North.

Dates	Spanish Explorers and Rulers	Portuguese Explorers and Rulers
	Ferdinand and Isabella, 1474-1516.	**Emanuel I., the Great, 1469-1521.**
1492	1492. CHRISTOPHER COLUMBUS, an Italian, supported by Ferdinand and Isabella, set sail from Palos, Spain (August 3), and discovered America (October 12), landing at one of the Bahamas, which he named San Salvador. During the following three months he visited the islands of Cuba and Hayti.	
	1498. Columbus made a THIRD voyage, discovering the island of Trinidad and the mainland of South America, near the mouth of the Orinoco River.	
	1499-1507. Amerigo Vespucci wrote a letter to a friend claiming to have discovered a part of the South American coast in 1499, and an account of this voyage was published. The new continent, therefore, was named after him by the German geographer Waldseemüller, who had read the account.	1499. VASCO DA GAMA DOUBLED THE CAPE OF GOOD HOPE AND REACHED INDIA. Another route to India was thus revealed
1500	1502. Columbus made a FOURTH voyage. He explored the coast of Central America and Panama, returned to Spain discouraged and died four years later in the belief that he had discovered India by sailing west.	1500. Cortereal, a Portuguese, explored the coast from Labrador to Nova Scotia.
1510	1512. PONCE DE LEON, seeking a legendary fountain of youth, DISCOVERED FLORIDA, so named because he landed on Easter Sunday, the Spanish "Feast of Flowers."	**French Explorers and Rulers**
	1513. BALBOA crossed the Isthmus of Panama and DISCOVERED THE PACIFIC, which he took possession of, with its coast and islands, for Spain.	**Francis I, 1515-1547.**
	Charles I. of Spain and Charles V. of Germany, Emperor. 1516-1556.	
	1519-1521. CORTEZ CONQUERED MEXICO for Spain. This conquest led to the establishment of Spain's Empire in the new world. The mines brought great wealth to Spain and formed the basis of Spanish prosperity in the following years.	
1520	1520. MAGELLAN, a Portuguese in Spain's service, discovered the strait named after him. He reached and named the PACIFIC OCEAN.	
1530	1521. Magellan discovered the PHILIPPINE ISLANDS. His followers, after his death, continued westward and completed the first circumnavigation of the globe in 1522.	1524. VERRAZANO, sailing in the service of France, traced the American coast northward from Cape Fear, and discovered New York harbor.
		1535. Cartier, in search of a northwest passage, ascended the St. Lawrence to Lachine Rapids and Mont Réal (Montreal).
1540	1539. CORONADO and a force of Spaniards marched northward from Mexico to Colorado and Kansas and discovered the GRAND CANON OF THE COLORADO RIVER.	**Charles IX., 1560-1574.**
1550	DE SOTO, at the same time, led an army of about a thousand into northwest Florida. HE REACHED THE MISSISSIPPI in 1541.	1541. Roberval and Cartier made an unsuccessful attempt to establish a French colony on the St. Lawrence.
	Philip II., 1556-1598.	1562. Jean Ribault establishes a Huguenot settlement at Port Royal.
1560	1565. The Spaniards, under MENENDEZ, founded ST. AUGUSTINE, Florida.	1565. The Huguenot settlement destroyed by Menendez.
		Henry IV., 1589-1610.
1570		
1580	1582. Spanish monks planted missions in New Mexico and Arizona.	
1590		
1600	1598. A Spanish settlement was planted by ONATE near SANTE FE, New Mexico.	
		1603. CHAMPLAIN entered the St. Lawrence. THE FRENCH OCCUPATION OF CANADA began with Champlain. His maps, reports, and settlements stimulated French enterprise.
		1605. Champlain founded PORT ROYAL (Annapolis, N. S.), and sailed in an exploring expedition as far south as Cape Cod.

UNITED STATES IN THE FORM OF PARALLEL OUTLINES

AND EXPLORATION, FROM 1492 TO 1607

missionaries and even Asiatics. Little importance attaches to any except those of the Norse dis- of North America about 1000 to 1004. The discoveries of Columbus and Vasco da Gama opened part of the present United States; while the English and French explored, claimed, and made

English Explorers and Rulers	European Events	Dates
Henry VII., 1485-1509.		
	1492. End of the Moorish dominion in Spain. Death of Lorenzo de Medici, the "Magnificent" at Florence.	**1492**
1497. JOHN CABOT, an Italian in the service of Henry VII. of England discovered the coast of NORTH AMERICA, probably at Labrador. He was accompanied by his son, Sebastian. 1498. Sebastian Cabot, on a SECOND voyage, probably explored the Atlantic coast from Labrador to Carolina. These voyages were not followed by any attempt at colonization.	1494. Beginning of a series of Italian wars, lasting till 1559.	
	1499. The Swiss gain their independence from the Emperor Maximilian.	
		1500
	1502. Outbreak of war between France and Spain in Italy.	
	1511. Pope Julius II. forms the Holy League against France and Spain.	**1510**
	1513. James IV. of Scotland invades England, and is killed at battle of Flodden Field. 1515. Wolsey appointed Chancellor by Henry VIII. of England. 1519. The German Empire, Spain, Netherlands, Two Sicilies and the Spanish Indies united under Charles V.	
		1520
Henry VIII., 1509-1547.	1521. Beginning of the wars between Charles V. of Germany and Francis I. of France.	
		1530
1527. Captain John Rut explores the coast of North America.	1527. Expulsion of the Medici from Florence.	
	1535. Henry VIII. of England assumes the title of supreme head of the Church in England.	**1540**
	1543. England enters into an alliance with Charles V. against France.	**1550**
	1562. Beginning of the Huguenot wars.	
Elizabeth 1558-1603.		**1560**
1576-1578. FROBISHER, in the interest of England, made three attempts to find a northwest passage to Asia.		
1578. DRAKE explored the Pacific coast as far north as the state of Washington. He had previously doubled Cape Horn. He claimed the land for England.		**1570**
	1581. Declaration of independence by the Dutch.	
1583. HUMPHREY GILBERT landed at St. John's, Newfoundland, and took possession of the country for England. 1584. SIR WALTER RALEIGH sent out an expedition under Captain Arthur Barlow. The expedition landed at Pamlico Sound and the region was named VIRGINIA in honor of Elizabeth.	Queen Elizabeth was financially interested in many of the expeditions which followed, and she knighted most of the men who commanded expeditions.	**1580**
1587. Raleigh despatched another expedition, consisting of two ships with one hundred and fifty men and women, to Roanoke Island. John White was the Governor. Virginia Dare, the first white child born in America, was born here.	1587. Execution of Mary, Queen of Scots. 1588. Battle of the Spanish Armada. 1595. France declares war against Spain.	**1590**
1602. GOSNOLD, an English merchant, made a settlement at Buzzard's Bay, R. I.		**1600**
James I., 1603-1625.		
1603. Martin Pring enters the present harbor of Plymouth.	1604. Charles IX. ascends throne of Sweden.	
	1606. In England there was organized the VIRGINIA COMPANY for the purpose of establishing trading colonies in America.	

II. THE COLONIAL PERIOD OF UNITED STATES HISTORY, INCLUDING

The real history of the United States begins with this period. Within it the original Thirteen power in the East was subdued; the Colonies increased in strength and self-reliance, and the struggle

THE SOUTHERN COLONIES

Virginia

1607. The London Company made THE FIRST PERMANENT ENGLISH SETTLEMENT IN AMERICA, AT JAMESTOWN, VIRGINIA (MAY 13). Jamestown was named after the English King, James I.

1619. Virginia settlers establish the *FIRST REPRESENTATIVE ASSEMBLY IN AMERICA*, called *The House of Burgesses*.

The FIRST SLAVES were sold in Virginia.

1622. An Indian attack was made on Jamestown.

1624. Virginia was made into a *royal colony*.

1642-1652. William Berkeley governor of Virginia, which became a refuge for Cavaliers from England.

1652. Puritan Commissioners with an army compelled Virginia to accept the rule of the Puritan Commonwealth.

1660. The restoration of Charles II. in England brought about the return of Berkeley in Virginia.

The restoration was welcomed by the Cavaliers of Virginia, but the Massachusetts Puritans delayed a year before proclaiming Charles king. A SECOND INFLUX OF PURITAN IMMIGRANTS FOLLOWED THE RESTORATION.

Maryland

1632. Lord Baltimore obtained a charter to Maryland.

1634. First permanent settlement made at ST. MARY'S by Calvert.

1645. Maryland Catholics and Virginia Puritans engaged in rebellion.

1649. The Maryland Assembly passed a TOLERATION Act.

1661. Charles Calvert appointed governor.

Carolinas

1653. Settlement of ALBEMARLE, North Carolina, by Virginia pioneers.

1663. Carolina granted to a company of proprietors.

1669. John Locke drafts a constitution for Carolina.

1670. CHARLESTON, S. C., settled and territory divided into North and South Carolina.

NEW ENGLAND COLONIES

Massachusetts

1607. The Plymouth Company established a colony on the Kennebec River, in Maine under Sir Ferdinando Gorges. The colony failed.

1620. The Pilgrim Fathers landed at Cape Cod November 11, and formed the FIRST SETTLEMENT IN NEW ENGLAND AT PLYMOUTH (December 22), under the FIRST REPUBLICAN FORM OF GOVERNMENT IN AMERICA.

1628. The permanent settlement of Massachusetts Bay Colony began by the settlement of SALEM under JOHN ENDICOTT.

1629-1640. The "Great Migration" of Puritans to Massachusetts.

1630. BOSTON WAS FOUNDED by the English Puritans. The first general court in New England met there October 19.

1641. Massachusetts Bay Colony adopted laws known as the *Body of Liberties*.

1643. THE FIRST INTER-COLONIAL UNION IN New England. It was formed for protection.

1658. Massachusetts made it a capital offense for Quakers to return to the colony after expulsion.

1675. KING PHILIP'S WAR broke out in New England.

New Hampshire

1623. First settlement on Piscataqua River, by John Mason.

1640. Provisional government established at Dover.

Connecticut

1633. Settled at Windsor by Pilgrims.

1633-1636. Colonization of Connecticut River valley.

1637. **Pequot Indian war.**

1662. Charter granted to Connecticut.

Rhode Island

1636. Roger Williams settles at Providence.

1638. Ann Hutchinson settled in Rhode Island.

1639. Newport founded.

1663. Charter granted to Rhode Island.

ITS SETTLEMENT (1607 TO 1689); AND ITS CONSOLIDATION (1689 TO 1763)

Colonies were established; New England and Virginia grew in influence and population; the Indian between England and France for control of the New World was settled in favor of the English.

THE MIDDLE COLONIES			Progress and Population	English Rulers and Events
New York				
				1603-1625. **James I.** 1603. Union of England and Scotland.
1609. Henry Hudson, employed by the Dutch East India Company, sailed up the Hudson River searching for a passage to the Indies. 1614. The Dutch established trading stations on Manhattan Island and at Fort Orange (Albany) on the Hudson. They called their possessions New Netherland.			1616. Tobacco first cultivated by the English in Virginia.	
		New Jersey		
1623. The Dutch founded a settlement on Manhattan Island which they called NEW AMSTERDAM (later New York City). 1626. Peter Minuit, director-general of New Netherland, purchased Manhattan Island from the Indians for $24.	Delaware	1623. Ft. Nassau (now Gloucester, N. J.) established by the Dutch.		1625-1649. **Charles I.** 1627. War with France, over the Huguenots.
1629. Establishment of the patroon system to encourage settlement in New Netherland.	1627. Swaanendael (now Lewis, Del.) founded.			
1636. Wealthy colonists from Holland settle at Ft. Orange.			1636. First college in America founded by Massachusetts. Two years later it is named Harvard in honor of John Harvard.	
	1638. A Swedish settlement was made near Wilmington, on the Delaware.		1639. First press in America set up at Cambridge. Stephen Daye was the printer, and the first American Book was *The Bay Psalm Book*.	
		1640. English settlements begun on Salem creek.	1640. **Whole number of emigrants to New England previous to this time about 21,200.**	1640. Meeting of the Long Parliament. 1642. Civil war begins.
1647-1664. Peter Stuyvesant governor of New Netherland.			1645. Massachusetts established free schools supported by the State.	
				1649. Execution of Charles I. 1649-1660. The Commonwealth under Cromwell.
1657. Proclamation issued against the Quakers.	1655. The Swedish settlements on the Delaware conquered by the Dutch.			1660. Restoration of the Stuarts. 1660-1685. **Charles II.**
			1661. Eliot's "Indian Testament" printed at Cambridge.	
	1664. Delaware passes under English rule.	1664. New Jersey granted to Berkeley and Carteret.	1664. Eliot's "Indian Bible" printed at Cambridge.	1668. Triple alliance of England, Sweden and Holland against France.
1670. Staten Island purchased from the Indians.				

II. THE COLONIAL PERIOD OF UNITED STATES HISTORY, INCLUDING ITS SET

THE SOUTHERN COLONIES			NEW ENGLAND COLONIES			
Virginia	**Carolinas**	**Maryland**	**Mssachusetts**	**Rhode Island**	**Connecticut**	**New Hampshire**
1676. BACON'S REBELLION broke out in Virginia.			1677. Maine became part of Massachusetts by purchase.			1680. New Hampshire declared a royal province.
			1684. Massachusetts becomes a royal colony. 1686-1689. Andros governor of all New England by royal appointment.			
1689-1697. KING WILLIAM'S WAR. The FIRST INTER-COLONIAL WAR. This marked the beginning of a contest which in America.			1691-1693. Salem witchcraft.			
1702-1714. QUEEN ANNE'S WAR. The SECOND INTER-COLONIAL WAR began between France and England. This war was the New Englanders retaliating.			1702. Joseph Dudley appointed governor.			
1728. Boundary established between Virginia and North Carolina.	1721-1729. The Carolinas are royal colonies. 1729. North and South Carolina permanently divided into two provinces.	1729. BALTIMORE founded.			1728-1731. Final boundaries established with New York and Rhode Island.	
	Georgia 1733. Last of the thirteen original colonies settled by Oglethrope at SAVANNAH.			1734. Assembly meets for first time at Greenwich.		
						1740. Boundaries of New Hampshire determined.
	1742. Spaniards attacked Georgia; defeated by Oglethrope.		1742. Peter Faneuil builds "Faneuil Hall."			
1744-1748. KING GEORGE'S WAR. The THIRD INTER-COLONIAL WAR broke out between England and France. New England colonists.		1744. Treaty with the "Six Nations."			1745. One thousand men sent against Louisburg.	1744. George Whitefield preaches in New Hampshire.
	1749. First English ship reaches Georgia.		1749. Famous Indian treaty renewed at Falmouth.			
1753. GEORGE WASHINGTON was sent by Governor Dinwiddie to order the French out of the Ohio valley.		1753. The Potomac River explored to its source.		1754. Providence library chartered.		
1754-1763. THE FRENCH AND INDIAN WAR. The FOURTH and LAST INTER-COLONIAL WAR broke out between the in 1763.						

TLEMENT (1607 TO 1689); AND ITS CONSOLIDATION (1689 TO 1763) — Continued

THE MIDDLE COLONIES				Progress and Population	English Rulers and Events
New York	**Pennsylvania**	**Delaware**	**New Jersey**		
				1676. **Population of New England estimated at 60,000.**	
				1680. John Buckner brings a printing press to Virginia and prints the session laws.	
	1681. Grant of Pennsylvania to William Penn.				
1683. First Assembly in New York under English rule.	1682. Philadelphia laid out by Penn, and Quaker emigration encouraged. Penn's treaty with the Indians.	1682. Delaware becomes part of Pennsylvania.			1685-1689. **James II.**
1689-1690. Leisler's rebellion in New York.				1689. First American newspaper published in Boston; suppressed by Massachusetts government.	1688-1689. The "Glorious Revolution." 1689-1702. **William III. and Mary.**
continued with little intermission until the downfall of French power					
				1692. The College of William and Mary was established in Virginia.	
				1700. **Population of colonies about 260,000.**	
	1701. Penn granted a Charter of Privileges to Pennsylvania which remained in force until 1776.			1701. Yale College was established in Connecticut.	1701. War of the Spanish succession.
confined mainly to the east; the French attacking New England, and					
					1702-1714. **Queen Anne.**
		1703. Delaware is made a separate colony.	1702. New Jersey becomes a royal province under the governor of New York.	1704. Appearance of "The Boston News Letter," the the first newspaper in America.	1702. Queen Anne war against France and Spain.
				1710. First post office in America at New York.	
					1714-1727. **George II.** 1718. War with Spain.
				1719. First Spinning-wheel and *cultivation of potatoes* introduced by the settlers of Londonderry, N. H.	
				1720. Tea begins to be used in New England.	
					1727-1760. **George II.**
				1729. "Pennsylvania Gazette" started by Franklin.	
	1733. Treaty with the "Six Nations."	1733. Delaware boundaries defined after twenty years' litigation.			
1735. Zenger's trial and acquittal in New York, establishes freedom of the press.			1738. Separate charter granted to New Jersey.	1736. Appearance of "The Virginia Gazette," first newspaper in the South.	1739. War with Spain.
				1740. University of Pennsylvania founded.	
				1741. Moravians first settle in United States at Bethlehem.	
1743. Sir George Clinton, governor.					
Louisburg was restored to France, much to the dissatisfaction of the					1744. War between England, France and Austria.
	1746. Thomas and Richard Penn sole proprietors of Pennsylvania.			1746. New Jersey College, afterwards Princeton.	
			1750. Trenton public library founded.	1749. **White population of the colonies 1,046,000.**	
				1752. *English Bible* first printed in America. Franklin experiments in electricity.	
1754. Convention at Albany to consider a colonial confederacy.					
				1754. King's College (now Columbia,) New York City, founded.	
French and English, which was ended by THE TREATY OF PARIS					1756-1763 Seven Years' war.

HISTORY OF THE UNITED STATES

When first visited by Europeans, the country now comprised within the United States was exclusively inhabited by the race commonly called American Indians.

FOREFATHERS' ROCK, PLYMOUTH, MASS.

Plymouth is of abiding interest as the landing place of the Pilgrim Fathers (December 21st, 1620) and the site of the first settlement in New England. Pilgrim Hall contains numerous interesting relics of the Pilgrims, paintings of their embarkation and anding, old portraits, etc. North Street leads to the so-called Plymouth Rock, a granite boulder enclosed by a railing and covered with a canopy. This, however, is only a fragment (broken off in 1774) of the flat rock where the Pilgrims landed, which lies nearer the sea and is now covered by a wharf. Cole's Hill, opposite the rock, was the burial-place of the early settlers (1620-1621). Leyden Street was the site of the first house. From the Town Square a path ascends to the right to the ancient Burial Hill, with the graves of many of the early settlers, including Governor Bradford. A fortified church was erected here in 1622. To the south is Watson's Hill, where the Pilgrims made a treaty with Massasoit in 1621. The National Monument to the Pilgrims, consisting of a granite pedestal forty-five feet high, surmounted by a figure of Faith, thirty-six feet high, and surrounded by seated figures twenty feet high, representing Law, Morality, Freedom and Education is about one-fourth mile from the railway station, on Allerton Street. The three hundredth anniversary of the landing of the Pilgrims will be elaborately celebrated here in 1920.

Period of Discovery.—According to the Scandinavian sagas, Leif, a Norwegian, sailed about 1001 from Iceland for Greenland, but was driven southward by storms till he reached a country called Vinland, which is supposed to have been Rhode Island or some other part of the coast of New England.

It is possible that some vague rumors of the Norse journeys had come to Christopher Columbus when he set out on Friday, August 3, 1492, to discover the western route to India. He sighted one of the Bahama Islands on October 12, and landed the following day. After cruising about for some time, he returned to Spain. He made in all four voyages to the New World for treasure-getting and discovery. His discoveries, it should be remembered, did not extend to the territory now occupied by the United States, but were confined to certain of the West India Islands, and parts of Central, and possibly, South America. (See further, under Outlines of American History.)

Among the earliest of his followers was Amerigo Vespucci, who in 1497-1498 explored the coasts of the Gulf of Mexico, and who has given his name to the whole continent.

In 1497, about five years after the discovery of America by Columbus, John Cabot sailed westward from Bristol, England, and on June 24 discovered land (Labrador), along which he coasted to the southwest nearly one thousand miles. In 1498 his son, Sebastian Cabot, sailed from the same port in search of a northwest passage to China, but finding the ice impenetrable, he turned to the south and coasted as far as Chesapeake Bay.

In 1513 the Spaniard Ponce de Leon discovered Florida. In 1539 took place the expedition of the Spainard De Soto, who in the course of two years penetrated overland from Tampa Bay on the west coast of Florida to a point two hundred miles beyond the Mississippi.

Period of Settlement.—In 1565 the Spaniards founded St. Augustine, the first permanent settlement in the United States. In 1585 an expedition sent by Sir Walter Raleigh made a settlement on Roanoke Island, N. C., which failed. In 1607 the English founded Jamestown on James River, Virginia, their first permanent settlement.* The master spirit of this enterprise was Captain John Smith. Plymouth, Mass., was founded in 1620 by the "Pilgrim Fathers," a body of Puritans led by John Carver and others, who sailed from England in the Mayflower. Salem was settled by John Endicott in 1628. In 1630 John Winthrop settled Boston. In 1692 Plymouth colony was united to Massachusetts. Portsmouth and Dover, in New Hampshire, were settled in 1623. The first permanent English settlements in Maine were made about the same time. These settlements ultimately fell under the jurisdiction of Massachusetts. Connecticut was colonized in 1635-1636 by emigrants from Massachusetts, who settled at Hartford, Windsor, and Wethersfield. Rhode Island was first settled at Providence in 1636 by Roger Williams. In 1623 permanent settlements were made by the Dutch at Fort

*Jamestown is seven miles from Williamsburg, formerly the ancient capital of Virginia and seat of the colonial governor. The only remains of the ancient town are the tower of the church (in which Pocahontas was married in 1614; church itself rebuilt in 1907) and a few tombstones.

Orange (now Albany) and at New Amsterdam on the present site of New York. The Swedes settled on the Delaware in 1638, and were expelled in 1655 by the Dutch army. The English seized New Amsterdam in 1664, and with it the whole of New Netherland, which they named New York from the Duke of York, to whom it had been granted by Charles II. New Jersey at this time acquired its distinctive name. In 1681 the territory west of the Delaware was granted to William Penn, who colonized it chiefly with Friends or Quakers, and founded Philadelphia in 1682. Maryland was settled in 1634 by Roman Catholics sent out by Lord Baltimore. The first permanent settlement in North Carolina appears to have been made about 1663, on Albemarle Sound, by emigrants from Virginia. The first permanent settlement in South Carolina was made in 1670 by colonists from England on the Ashley River, near the site of Charleston, which began to be settled about the same time. Georgia was settled by General James Oglethorpe, who in 1733 founded Savannah.

How Europe First Divided the American Colonies.—It will thus be seen that what is now the territory of the United States has been derived from six European nations. Resting on the discovery by Columbus and the bulls of the popes, Spain claimed the whole continent, but has been in actual possession only of the Gulf coast from Florida to Texas, and of the interior from the Mississippi to the Pacific. The Swedes once had settlements on the Delaware. The Dutch, following up the voyage of Hudson to the river bearing his name, claimed and held the country from the Delaware to the Connecticut. The French discovered the St. Lawrence and explored and held military possession of the valleys of the Mississippi and Ohio and the Great Lakes. The English, by virtue of the voyages of the Cabots, claimed the Atlantic coast, and there founded the colonies which grew into the thirteen United States.

In the course of the struggle, sometimes peaceful, often bloody, by which the rule of these nations has been thrown off, the Dutch conquered the Swedes; the English conquered the Dutch and the French; the United States expelled the English, and in time, by purchase or conquest, drove out the Spaniards and the Mexicans.

Struggle of England and France for America.—The first serious struggle for possession occurred in the middle of the eighteenth century, when the English, moving westward, met the French moving eastward at the source of the river Ohio. In that struggle, which has come down to us as the "French and Indian war," France was worsted, and, retiring from this continent, divided her possessions between England and Spain. To England she gave Canada and the islands and shores of the Gulf of St. Lawrence, and, entering what is now the United States, drew a line down the middle of the Mississippi River, and gave all to the east of that line (save the island on which is the city of New Orleans) to Great Britain, and all to the west of it to Spain; Spain at the same time gave Florida to England as the price of Cuba.

Oppression of the Colonies under British Rule.—Having thus come into possession of all the country to the east of the Great River, King George determined to send out an army of ten thousand men to defend the colonies, and have the latter bear a part of the expense. This part he attempted to collect by duties on goods imported, and by a Stamp Tax (1765) on legal documents and printed matter. No tax for revenue had before been laid on America by act of Parliament. The colonists, therefore, resisted this first attempt, and raising the cry, "No taxation without representation," they forced Parliament to repeal the Stamp Tax in 1766. The right to tax was at the same time distinctly asserted, and in 1767 was again used, and duties laid on paints, oils, lead, glass, and tea. Once more the colonists resisted, and, by refusing to import any goods, wares, or merchandise of English make, so distressed the manufacturers of England that Parliament repealed every tax save that on tea. All the tea needed in America was now smuggled in from Holland. The East India Company, deprived of the American market, became embarrassed, and, calling on Parliament for aid, was suffered to export tea, a privilege never before enjoyed.

Selecting commissioners in Boston, New York, Philadelphia, and Charleston, cargoes of tea were duly consigned to them by the East India Company; but the people agreed not to buy any of this tea or allow it to be sold. At Boston men disguised as Indians boarded the tea ships, overcame the guards, and destroyed the tea by throwing the boxes into the harbor. This has gone down in history as the "Boston Tea Party."

The Continental Congress and the Revolution.—As a punishment for this, Parliament shut the port of Boston and deprived the people of Massachusetts of many functions of local government. The Assembly of Massachusetts thereupon called for a General Congress to meet at Philadelphia on September 5, 1774. The colonies gladly responded and this congress, having issued a Declaration of Rights and Addresses to the king, to Parliament, and to the people of England, adjourned to await the result.

The day for the reassembling of Congress was May 10, 1775; but, before that day came, the attempt of General Gage to seize military stores brought on a fight at Lexington, April 19, 1775. The fight at Lexington was followed by the siege of the British in Boston, by the formation of the "Continental Army," by the appointment of George Washington to command it, by the battle of Bunker Hill, June 17, 1775, and by an expedition against Quebec, which came to naught, on the last day of the year.

General William Howe meantime had succeeded Gage in command of the British at Boston, and, finding himself hard pressed by Washington, evacuated the city and sailed for Halifax. Believing New York was to be attacked, Washington now hurried to Long Island, where, August 27, 1776, Howe defeated him, took possession of New York, and drove him first up the Hudson and then southward across New Jersey.

American Independence Declared.—Congress, which, July 4, 1776, at Philadelphia, had declared the colonies to be free and independent states, now fled from that city to Baltimore. But Washington, turning in his retreat, surprised and captured the British outpost at Trenton. Cornwallis instantly hurried toward that town, but Washington, passing around the British rear, attacked and captured at Princeton, January 3, 1777, a detachment on its march to Trenton, and then went into winter quarters at Morristown.

With the return of spring Howe, finding that he could not reach Philadelphia by land without passing in front of the Continental army stretched out on a strongly intrenched line across New Jersey, went by sea. Washington met him at Chadd's Ford on the Brandywine, was defeated, and on September 25, 1777, Howe entered Philadelphia. In the attempt to dislodge him Washington fought and lost the battle of Germantown, October 4, 1777; the loss of Philadelphia was more than made good by the capture of Burgoyne and his army at Saratoga, October 17, 1777, while on his way from Canada to New York City.

The fruits of this victory were the recognition of the independence of the United States by France, the treaty of alliance with France, February 8, 1778, and the evacuation of Philadelphia by General Clinton, who had succeeded Howe. Washington, who had spent the winter at Valley Forge, instantly followed, and overtaking Clinton at Monmouth fought and won

PRINCIPAL CAMPAIGNS AND BATTLES OF THE AMERICAN REVOLUTION

The leading battles are indicated in **bold-face;** successful commanders in *italics*

Names, Dates and Places of Campaigns and Battles	Commanders		Engaged	
	American	British	Amer.	British
1775-1776				
Campaign in New England				
Lexington, Concord (April 19, 1775)	Barret and Butterick	*Smith* and *Lord Percy*	.....	1,700
Ticonderoga (May 10, 1775)	*Ethan Allen* and *Eaton*	Delaplace	83	48
Bunker Hill (June 17, 1775)	Warren, Prescott and Putnam	*Howe* and *Pigot*	3,000	4,500
Quebec (December 6-31, 1775)	Schuyler, Montgomery and Arnold	*M'Lean* and *Carleton*	900	1,200
Norfolk, Va. (Dec. 9, 1775)	Woodford	Lord Dunsmore	.....	.....
Boston (March 17, 1776)	The British evacuate the city and harbor.			
Charleston (Ft. Moultrie) (June 28, 1776)	*Moultrie, Lee* and *Armstrong*	Clinton	400	4,000
1776-1778				
Campaign in Middle States				
Brooklyn, L. I. (Aug. 26, 1776)	Green and Sullivan	*Howe, Clinton* and *Cornwallis*	10,000	20,000
Harlem Plains, N. Y. (Sept. 16, 1776)	Washington	.....	.....	.....
White Plains, N. Y. (Oct. 28, 1776)	Washington	*Howe*	1,600	2,000
Fort Washington, N. Y. (Nov. 16, 1776)	Magaw	*Howe*	3,000	5,000
Trenton, N. J. (Dec. 26, 1776)	*Washington*	Lord Cornwallis and Rahl	2,400	1,000
Princeton, N. J. (Jan. 3, 1777)	*Washington*	Mawhood	3,000	1,800
Bennington, Vt. (Aug. 15, 16, 1777)	*Stark* and *Warner*	Baum and Beyman	.....	1,200
Brandywine, Pa. (Sept. 11, 1777)	Washington	*Howe*	11,000	18,000
Bemis Heights, N. Y. (Sept. 19, 1777)	*Gates*	Burgoyne	2,500	3,000
Germantown, Pa. (Oct. 4, 1777)	Washington	*Howe*	11,000	15,000
Stillwater (Saratoga) (Oct. 7, 1777)	*Gates*	Burgoyne	8,000	6,000
Monmouth, N. J. (June 28, 1778)	*Washington*	Sir Henry Clinton	12,000	11,000
1778-1781				
Campaign in the South				
Savannah, Ga. (Dec. 29, 1778)	Robert Howe	*Campbell*	900	2,000
Brier Creek, Ga. (Mar. 3, 1779)	Ashe	*Prevost*	1,200	1,800
Stony Point, N. Y. (July 16, 1779)	*Wayne*	Clinton	1,200	600
Chemung, N. Y. (Aug. 29, 1779)	*Sullivan*	Brant	4,000	1,500
Savannah, Ga. (Oct. 9, 1779)	Lincoln	*Prevost*	4,500	2,900
Charleston, S. C. (May 12, 1780)	Lincoln	*Clinton*	3,700	9,000
Camden, S. C. (Sanders Creek) (Aug. 15, 1780)	Gates	*Cornwallis*	3,000	2,200
King's Mountain, S. C. (Oct. 7, 1780)	*Campbell*	Ferguson	900	1,100
Cowpens, S. C. (Jan. 17, 1781)	*Morgan*	Cornwallis and Tarleton	900	1,100
Guilford C. H., N. C. (Mar. 15, 1781)	Greene	*Cornwallis*	4,400	2,400
Hobkirk's Hill, S. C. (April 25, 1781)	Greene	*Rawdon*	1,200	900
New London, Conn., Fort Griswold (Sept. 6, 1781)	Ledyard	*Benedict Arnold* and *Eyre*	150	800
Eutaw Springs, S. C. (Sept. 8, 1781)	*Greene*	Lord Rawdon	2,000	2,800
Yorktown, Va. (Oct. 17-19, 1781)	*Washington*	Cornwallis	16,000	7,500

the battle at that place, June 29, 1778. Clinton escaped to New York, and Washington, drawing his army in a circle about the city from Morristown on the south to West Point on the north, awaited further movements.

Treason of Arnold and Execution of André.—Turning towards the Southern states, the British commander now dispatched an expedition which took Savannah and overran the State of Georgia. The year which followed (1779) is memorable for the capture of Stony Point by Anthony Wayne; for the treason of Benedict Arnold; for the execution of Major John André; for the capture of the "Serapis" by Paul Jones after one of the most desperate naval battles on record, and by the failure of an attempt by the Americans to retake Savannah. In 1780 Clinton led an expedition from New York to Charleston, took the city, swept over South Carolina, and, leaving Cornwallis in command, hurried back to New York. Gates, who now attempted to dislodge the British, was beaten. Greene now succeeded Gates, and Morgan, the commander of his light troops, won the battle of the Cowpens, January 17, 1781. This victory brought up Cornwallis, who chased Greene across the State of North Carolina to Guilford Court House, where Greene was beaten and Cornwallis forced to retreat to Wilmington. Moving southward, Greene was again beaten in two pitched battles, but forced the British to withdraw within their lines at Charleston and Savannah.

Cornwallis meantime moved from Wilmington into Virginia and took possession of Yorktown. And now Washington, who had long been watching New York, again took the offensive, hurried across New Jersey and Pennsylvania, and, while a French fleet closed the Chesapeake Bay, he besieged Cornwallis by land, till, October 19, 1781, the British general surrendered. This practically ended the war.

The treaty of peace, at Paris, in 1783, actually ended it, secured the independence of the United States, and fixed her boundaries, roughly speaking, as the Atlantic Ocean on the east, the Mississippi on the west, New Brunswick, the St. Lawrence, and the Great Lakes on the north, and the parallel of thirty-one degrees on the south.

Articles of Confederation and their Weakness.—While the war was still raging Congress had framed an instrument of government, which the states ratified and put in force on March 1, 1781. This instrument of government which bound the thirteen states in perpetual union was known as the Articles of Confederation, and established a government as bad as any yet devised by man. There was no executive, no judiciary, and only the semblance of a legislature. The Congress consisted of not more than seven nor less than two delegates from each state; sat in secret session; was presided over by a president elected from its own members; and could not pass any law unless the delegates of nine states assented. It could wage war, make treaties, and borrow money; but it could not lay a tax of any kind whatsoever; nor regulate commerce between the states, or with foreign powers; and was dependent entirely on the liberality of the states for revenues. This defect proved fatal. Inability to regulate foreign commerce by duties stripped the country of its specie. Lack of specie forced the states to issue paper money. Paper money was followed by tender acts and force acts, and in some places by a violent stoppage of justice to the debtor class. A commercial and financial crisis followed and the people of the states, reduced to desperation, gladly acceded to a call for a national trade convention, which met in Philadelphia in May, 1787. The instructions of the delegates bade them suggest amendments to the Articles of Confederation. But the convention, considering the Articles too bad to be mended, framed the Constitution, which the people, acting through conventions in the various states, ratified during 1787 and 1788.

Adoption of the Constitution and Organization of Parties.—On March 4, 1789, the Constitution became the supreme law of the land. In the first Congress no trace of party lines is visible. But the work of establishing government had not gone far when differences of opinion sprang up; when the cry of partial legislation was raised, and the people all over the country began to divide into two great parties—those who favored and those who opposed a liberal construction of the language of the Constitution and the establishment of a strong national government.

The friends of national government took the name of Federalists, and under the lead of Alexander Hamilton, who as Secretary of the Treasury marked out the financial policy of the administration, they funded the foreign and domestic debt occasioned by the war for independence, assumed the debts incurred by the states in that struggle, set up a national bank with branches, and laid a tax on distilled liquors.

Each one of these acts was met with violent opposition, as designed to benefit a class, as unconstitutional, and as highly detrimental to the interests of the South. Against the Federalists were now brought charges of a leaning towards monarchy and aristocracy. Great Britain, it was said, has a funded debt, a bank, and an excise. These things are, therefore, monarchial institutions. But the Federalists have introduced them into the United States. The Federalists, therefore, are aristocrats, monarchists, and monopolists.

Of all who believed these charges, none believed them more sincerely than Thomas Jefferson, Secretary of State. Seeing in these acts a wide departure from the true principles of democracy, he set himself to work to organize a party of opposition, and was soon looked up to as the recognized leader of the Federal Republicans.

Hardly had the two parties thus been called into existence by difference of opinion on questions of home affairs, when they were parted yet more widely, and the dispute between them intensely embittered by questions of foreign affairs.

Effect of the French and English Affairs Upon the New Nation.—In 1793 the French Republic declared war against England, and sent a minister to the United States. As the

United States was bound to France by the treaty of alliance and by a treaty of amity and commerce, and was not bound to Great Britain by any commercial treaty whatever, it seemed not unlikely that she would be dragged unwillingly into the war. But Washington, with the advice of his secretaries, proclaimed neutrality, and from that time every Republican was the firm friend of France and every Federalist the ally of England. Then began a seven years' struggle for neutrality. France threw open her colonial ports to neutral commerce; Great Britain asserting the "Rule of the War of 1756," a rule prescribing that no neutral should have in time of war a trade it did not have in peace, declared this trade was contraband, and seized the ships of the United States engaged in it. The Republicans denounced neutrality and attempted to force a war. The Federalists in alarm dispatched John Jay, the Chief Justice, to London, with offers of a commercial treaty. England responded and on February 29, 1796, the first treaty of amity and commerce between her and the United States became law. At this France took offense, rejected the new minister (C. C. Pinckney) from the United States, and drove him from her soil, suspended the treaties, insulted a special commission (sent out in the interest of peace), with demands for bribes and tribute, and almost brought on war.

Never since the days of Bunker Hill had the country been so stirred as this act of the French Directory stirred it in the summer of 1798. Then was written our national song, "Hail Columbia." Then was established the department of the navy. Then, under the cry, "Millions for defense; not a cent for tribute," went forth that gallant little fleet which humbled the tri-color in the West Indies and brought France to her senses.

Causes and Events of the War of 1812.—With the elevation of Napoleon to the First Consulship came peace in 1800. In that same year the Federalists fell from power, never to return. Once in power, the Republicans began to carry out the principles they had so long preached. They reduced the national debt; they repealed the internal taxes. They sold the navy; boldly assaulted the Supreme Court; and in 1811, when the charter of the National Bank expired, refused to renew it. Their doctrine of strict construction, however, was ruined, when, in 1803, they bought the Province of Louisiana from France and added to the public domain that splendid region which lies between the Mississippi and the Rocky Mountains.

At that moment it seemed as if the people were about to enter on a career of unwonted prosperity. But Napoleon suddenly made war on England, and by 1806 the United States was involved in a desperate struggle of nine years, both with France and England, for commercial independence. Great Britain searched our ships, impressed our sailors, violated the neutrality of our ports, and by the decisions of her admiralty courts and by orders in council sought to ruin our neutral commerce with Europe, unless carried on through her ports and under her license. Napoleon attacked us with his decrees of Berlin and Milan, and sought to ruin our neutral commerce with England. The United States retaliated by means of the embargo and non-intercourse, and, in 1812, declared war

CAMPAIGNS AND BATTLES OF THE WAR OF 1812-1815

Principal Land Battles

1812.—August 16, the surrender of Detroit by Hull to Brock.

October 13, defeat of Van Rensselaer by Brock at Queenstown.

1813.—January 18-22, the Americans were defeated at Frenchtown by General Proctor, whose Indians massacred the wounded Americans.

April 27, York (Toronto) was captured by the Americans under General Pike.

October 5, General Harrison forced General Proctor to retreat into Canada, and October 5 at the battle of the Thames routed the British and their Indian allies. Tecumseh was killed, the territory lost by Hull regained, and Upper Canada was retained to the end of the war.

November 11, the Americans moved on Montreal, but were defeated at Chryslers Field, and retreated.

1814.—July 25, Winfield Scott again invaded Canada and gained victories at Chippewa (July 5) and at Lundy's Lane.

August 24, capture of Washington and burning of the Capitol, the White House, and other buildings.

1815.—January 8, a large body of English veterans were landed in Louisiana, and attacked New Orleans; in this battle, which took place before the news of the treaty of peace reached the combatants, Jackson won a decisive victory.

Principal Naval Battles

1812.—August 19, the *Constitution* destroys the British *Guerriere*, in the Gulf of St. Lawrence.

October 18, the American *Wasp* captures the *Frolic*.

October 25, Captain Decatur in the *United States* took the *Macedonian*.

December 29, the *Constitution* captures the *Java*.

1813.—February 24, the American *Hornet* captures the *Peacock*.

June 1, the *Chesapeake* is captured by the British *Shannon*.

September 10, Commodore Perry with a fleet of nine vessels destroys the British squadron of six vessels on Lake Erie.

1814.—September 3, naval attack on Fort McHenry by the British fails.

September 11, Captain Macdonough, on Lake Champlain, completely defeated a British fleet stronger than his own; this checked a serious invasion of the enemy.

Treaty and Results of the War

December 24, 1814, a treaty of peace was made at Ghent, the end of the Napoleonic wars having removed the cause for England's offensive policy at sea.

The provisions included:

(1) A return of captured territory.

(2) Nothing was said about impressment.

(3) No compensation was secured by the Americans for ships captured previous to 1812.

The results of the war were:

(1) An increase of debt.

(2) An outburst of national patriotism.

(3) The removal of America from participation in European politics.

(4) The development of manufacturing.

(5) The establishment of the protective tariff policy.

With the Cessation of Hostilities Another Epoch in Our History Begins.—From the day when Washington proclaimed neutrality in 1793, to the day when the people celebrated, with bonfires and with fireworks, and with public dinners, the return of peace in 1815, the political and industrial history of the United States is deeply affected by the political history of Europe. It was questions of foreign policy, not of domestic policy, that divided the two parties, that took up the time of Congress, that raised up and pulled down politicians. But after 1815 foreign affairs sank into insignificance, and for the next thirty years the history of the United States is the history of political and economic development of the country to the east of the Mississippi River.

Fall of the Federalists, or Pro-British Party.—The opposition which the Federalists made to the war completed their ruin. In 1816 for the last time they put forward a presidential candidate, carried three states out of nineteen, and expired in the effort. During the eight years of Monroe's administration (1817-1825) but one great and harmonious party ruled the political destinies of the country. This remarkable period has come down to us in history as the "era of good feelings." It was indeed such an era, and so good were the feelings that in 1820 when Monroe was re-elected no competitor was named to run against him. Every state, every electoral vote save one was his. Even that one was his. But the elector who controlled it threw it away on John Quincy Adams lest Monroe should have the unanimous vote of the presidential electors, an honor which has been bestowed on no man save Washington.

Rise of the Protective Tariff Policy.—In the midst of this harmony, however, events were fast ripening for a great schism. Under the protection offered by the commercial restrictions which began with the embargo and ended with the peace, manufactures had sprung up and flourished. If they were to continue to flourish they must continue to be protected, and the question of free trade and protection rose for the first time into really national importance.

The rush of population into the West led to the admission of Indiana (1816), Mississippi (1817), Illinois (1818), Alabama (1819), and Missouri (1820) into the Union, and brought up for serious discussion the uses to be made of public lands lying within them.

The steamboat, which had been adopted far and wide, had produced a demand for some improved means of communication by land to join the greater water highways of the country and opened the era of internal improvements.

The application of Missouri for admission into the Union brought up the question of the admission of slavery to the west of the Mississippi. A series of decisions of the Supreme Court, setting aside acts of the state legislatures, gave new prominence to the question of state rights.

A Decade of Great Political Contests.—The Missouri question was settled by the famous Compromise of 1820 (the first great political compromise), which drew the line thirty-six degrees thirty minutes from the Mississippi to the hundredth meridian, and pledged all to the north of it, save Missouri, to freedom. But the others were not to be settled by compromise, and in the campaign of 1824 the once harmonious Republican party was rent in pieces. Each of the four quarters of the Republic put a candidate in the field and "the scrub-race for the presidency" began.

The new manufacturing interests of the East put forward John Quincy Adams. The West, demanding internal improvements at public expense, had for its candidate Henry Clay. William H. Crawford of Georgia (nominated by a caucus of Congressmen) represented the old Republican party of the South. Andrew Jackson of Tennessee stood for the new Democracy, for the people, with all their hatred of monopolies and class control, their prejudices, their half formed notions, their violent outbursts of feeling.

Behind none of them was there an organized party. But taking the name of "Adams men" and "Clay men," "Crawford men" and "Jackson men," the friends of each entered the campaign and lost it. No candidate secured a majority of the electoral college, and the House of Representatives chose John Quincy Adams.

The Triumph of Democracy and Industrial Expansion.—Under the administration of Adams (1825-1829) the men who wished for protection and the men who wished for internal improvements at government expense united, took the name first of National Republicans, and then of Whigs, and, led on by Henry Clay and Daniel Webster, carried through the high protection tariffs of 1828 and 1832. The friends of Jackson and Crawford took the name of Democrats, won the election of 1829, and during twelve years governed the country.

In the course of these years the population of the United States rose to seventeen million, and the number of states to twenty-six. Steam navigation began on the ocean; two thousand miles of railroad were built in the land; new inventions came into use; and the social and industrial life of the people was completely revolutionized. The national debt was paid; a surplus accumulated in the Treasury; the sale of public lands rose from three million dollars in 1831 to twenty-five million dollars in 1836; and the rage for internal improvements burned more fiercely than ever. A great financial panic spread over the country; the charter of the National Bank expired, a hundred "wild-cat banks" sprang up to take its place, and the question of the abolition of slavery became troublesome.

Early Troubles in Our System of Public Finance.—On the great questions which grew out of this condition of affairs the position of the two parties was well defined. The Democrats demanded a strict construction of the Constitution; no internal improvements at public expense; a surrender of the public lands to the state in which they lay; no tariff for protection; no National Bank; no agitation of the question of the abolition of slavery; the establishment of subtreasuries for the safe

keeping of the public funds, and the distribution of the surplus revenue. The Whigs demanded a recharter of the National Bank; a tariff for protection; the expenditure of the surplus on internal improvements; the distribution of the money derived from the sale of public lands; a limitation of the veto power of the President; and no removals from office for political reasons.

The Democrats, true to their principles, and having the power, carried them out. They destroyed the Bank; they defeated bill after bill for the construction of roads and canals; they distributed thirty-eight million dollars of the surplus revenue among the states, and by the cartage of immense sums of money from the East to the far distant West, hastened that inevitable financial crisis known as the "panic of 1837."

Andrew Jackson had just been succeeded in the presidency by Martin Van Buren (1837-1841) and on him the storm burst in all its fury. But he stood it bravely, held to a strict construction of the Constitution, insisted that the panic would right itself without interference by the Government, and stoutly refused to meddle. Since the refusal of Congress to recharter the Bank of the United States, whose charter expired in 1836, the revenue of the Government had been deposited in certain "pet banks" designated by the Secretary of the Treasury. Every one of them failed in the panic of 1837. Van Buren therefore recommended "the divorce of Bank and State," and after a struggle of three years his friends carried the "subtreasury" scheme in 1840. This law cast off all connection between the state banks and the Government, put the collectors of the revenue under heavy bonds to keep the money safely till called for by the Secretary of the Treasury, and limited payments to or by the United States to specie.

National Conventions and Rise of Slavery Issue.—The year 1840 was presidential year, and is memorable for the introduction of new political methods; for the rise of a new and vigorous party; and for the appearance of a new political issue. The new machinery consisted in the permanent introduction of the national convention for the nomination of a president, now used by the Democrats for the second time, and by the Whigs for the first; in the promulgation of a party platform by the convention, now used by the Democrats for the first time; and in the use of mass meetings, processions, songs, and all the paraphernalia of a modern campaign by the Whigs.

The new party was the Liberty Party, and the new issue the "absolute and unqualified divorce of the general Government from slavery, and the restoration of equality of rights among men." The principles of that party were: slavery is against natural right, is strictly local, is a state institution, and derives no support from the authority of Congress, which has no power to set up or continue slavery anywhere; every treaty, every act, establishing, favoring, or continuing slavery in the District of Columbia, in the territories, on the high seas, is, therefore, unconstitutional.

The Short-lived Era of the Whigs.—The candidate of this party was James Gillespie Birney. The Democrats nominated Martin Van Buren. The Whigs put forward William Henry Harrison and elected him. Harrison died one month after his inauguration, and John Tyler, the Vice-President and a Democrat of the Calhoun wing, became President.

The Whig policy as sketched by Clay was the repeal of the Subtreasury Act; the charter of a National Bank; tariff for protection; and the distribution of the sales of public lands. To the repeal of the Subtreasury Act Tyler gladly assented. To the establishment of a bank even when called "Fiscal Corporation," he would not assent, and, having twice vetoed such bills, was read out of the party by a formal manifesto issued by Whig congressmen.

It mattered little, however, for the question of the hour was not the bank, nor the tariff, nor the distribution of the sales of lands, but the annexation of the republic Texas. Joined to the demand for the reoccupation of Oregon, it became the chief plank in the Democratic platform of 1844. The Whig platform said not a word on the subject, and the Liberty Party, turning with loathing from the cowardice of Clay, voted again for Birney, gave the State of New York to the Democrats, and with it the presidency.

The Annexation of Texas, and Wilmot Proviso.—Accepting the result of the election as "instruction from the people," Congress passed the needed act and Tyler in the last hours of his administration declared Texas annexed.

The boundary of the new state was ill defined. Texas claimed to the Rio Grande. Mexico would probably have acknowledged the Nueces River. The United States attempted to enforce the claim of Texas, sent troops to the Rio Grande, and so brought on the Mexican war.

At the close of the Mexican war the boundary of the United States was carried south from forty-two degrees to the Gila River, and what is now California, Nevada, Arizona, New Mexico, Utah, and more than half of Wyoming and Colorado were added to the public domain. While the war was still raging, Polk, who had succeeded Tyler, asked for two million dollars to aid him in negotiating peace. Well knowing that the money was to be used to buy land from Mexico, David Wilmot moved in the House of Representatives that from all territory bought with the money slavery should be excluded. This was the famous Wilmot proviso. It failed of adoption and the territory was acquired in 1848, with its character as to slavery or freedom wholly undetermined.

The Preliminary Struggle over the Slave Problem.—And now the old parties began to break up. Democrats who believed in the Wilmot proviso, and Whigs who detested the annexation of Texas, the war with Mexico, and the extension of slavery went over in a body to the Liberty Party, formed with it the Freesoil Party, nominated Martin Van Buren, and gave him three hundred thousand votes. In their platform they declared that Congress had no more power to make a slave than to make a king; that they accepted the issue thrust on them by the South; that to

THE MEXICAN WAR, 1846-1848

Causes of the War

(1) Long-standing irritation over claims of American citizens upon Mexico, which the latter refused to pay.

(2) The annexation by the United States of Texas, which Mexico claimed as still a part of her territory.

(3) Disputes as to whether the Rio Grande or Nueces River was the boundary of Texas.

Results of the War

The Treaty of Guadalupe Hidalgo, in 1848, closed the war. Its chief provisions were:

(1) The Rio Grande was made the boundary between Texas and Mexico.

(2) California and New Mexico were ceded to the United States.

(3) The United States paid Mexico $15,000,000, and assumed $3,500,000 due American citizens.

The slavery question was intensified in American politics.

PRINCIPAL BATTLES

NOTE: The Americans were victorious in every conflict.

Place of Battle	Dates	Commanders		Engaged	
		American	Mexican	American	Mexican
Bracite	Dec. 25, 1846	Doniphan	Ponce de Leon	500	1,200
Buena Vista	Feb. 23, 1847	Taylor	Santa Anna	4,700	17,000
Cerro Gordo	April 18, 1847	Scott	Santa Anna	8,500	12,000
Chapultepec	Sept. 13, 1847	Scott	Santa Anna	7,200	25,000
Contreras	Aug. 20, 1847	Scott	Valencia	4,000	7,000
Churubusco	Aug. 20, 1847	Scott	Santa Anna	8,000	25,000
Huamantla	Oct. 9, 1847	Lane	Santa Anna	500	1,000
Mexico	Sept. 14, 1847	Scott	Santa Anna	6,000	.....
Molino del Rey	Sept. 8, 1847	Worth	Alverez	3,500	14,000
Monterey	Sept. 24, 1846	Taylor	Ampudia	6,600	10,000
Palo Alto	May 8, 1846	Taylor	Arista	2,300	6,000
Resaca de la Palma	May 9, 1846	Taylor	Arista	2,000	5,000
Sacramento	Feb. 28, 1847	Doniphan	Trias	900	4,000
Vera Cruz	Mar. 27, 1847	Scott	Landero	12,000	6,000

The only naval engagements of importance during the war with Mexico were the bombardment of Vera Cruz, by Commodore Conner, which lasted four days, and the bombardment of Monterey, Commodore Sloat, both cities being forced to surrender.

the demand for more slave states and more slave territories they answered, no more slave states, no more slave territories; and that on their banner was inscribed "Free Soil, Free Speech, Free Labor, and Free Men." As the defection of Whigs to the Liberty Party in 1844 gave New York state to the Democrats and elected Polk, so the defection of Democrats to the Free Soilers in 1848 gave New York to the Whigs and elected Taylor. As Harrison, the first Whig president, died one month after taking office, so Taylor, the second Whig president, died suddenly when a little over one year in office, just as the great Whig compromise of 1850 was closing. The imperative need of civil government in the new territory, the discovery of gold in California, the rush of men from all parts of the earth to the Pacific Coast forced Congress to establish organized territories. The question was: shall they be opened or closed to slavery? But, as the soil had been free when acquired from Mexico, the question really was: shall the United States establish slavery?

The Democrats, holding that slaves were property, claimed the right to take them into any territory, and asserting the principle of "squatter sovereignty," claimed the right of the people living in any territory to settle for themselves whether it should be slave or free. The Free Soilers demanded that the soil having been free when a part of Mexico, should be free as a part of the United States. Between these two Clay now stepped in to act as pacificator. Taking up the grievances of each side, he framed and carried through the measure known as the Compromise of 1850, the third great political compromise in our history. The fruit of this was the admission of California as a free state; the passage of a more stringent law for the recovery of fugitive slaves; the abolition of the slave trade in the District of Columbia; and the organization of Utah and New Mexico on the basis of "squatter sovereignty."

This done, senators and representatives of all parties joined in a manifesto declaring that the issues resting on slavery were dead issues, and that they would neither vote for, nor work for any man who thought otherwise. But thousand did think otherwise. The action of Clay pleased none. Anti-slavery men deserted him in the North; pro-slavery men deserted him in the South; and in 1852 the Whig party carried but four states out of thirty-one and perished. Even its two great leaders, Clay and Webster, were, by that time, in their graves.

Excited by such success, the Democrats, led on by Stephen A. Douglas, now broke through the compromise of 1820 and in 1854 applied "squatter sovereignty" to the organization of the territories of Kansas and Nebraska. Against this violation state legislatures, the people, the pulpit, and the press protested vigorously, for every acre of Kansas and Nebraska lay to the north of 36° 30′ and was solemnly pledged to freedom. But the Democratic leaders would not listen and drove from their ranks another detachment of voters. The effect was soon manifest. The little parties began to unite and when, in 1856, the time came to elect another president, the Republican Party of to-day was fully organized and ready. Once more and for the last time for twenty-eight years the Democrats won.

Buchanan's Administration the Prelude to the Civil War.—The administration of James Buchanan (1857-1861) marks an epoch. The question before the country was that of the extention of slavery into the new territories. Hardly had he been inaugurated when the Supreme Court handed down a decision on the case of Dred Scott, which denied the right of Congress to legislate on slavery, set aside the compromises of 1820 and 1850 as unconstitutional, and opened all the territories to slavery.

Rise of the Republican Party and Election of Lincoln.—From that moment the Whig and Democratic parties began to break up rapidly till, when 1860 came, four parties and four presidential candidates were in the field. The Democratic party, having finally split at the national convention for nominating a president and vice-president, the southern wing put forward Breckenridge and Lane and demanded that Congress should protect slavery in the territories. The northern wing nominated Stephen A. Douglas and declared for squatter sovereignty and the compromise of 1850. A third party, taking the name of "Constitutional Union," declared for the Constitution and the Union at any price and no agitation of slavery, nominated Bell and Everett, and drew the support of the old Whigs of the Clay and Webster school. The Republicans, declaring that Congress should prohibit slavery in the territories, nominated Abraham Lincoln and Hannibal Hamlin and won the election.

Secession, and the Formation of the Confederacy.—The State of South Carolina immediately seceded and before the end of February, 1861, was followed by Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas. Taking the name of the Confederate States of America, they formed first a temporary and then a permanent government, elected Jefferson Davis president, raised an army, and besieged Fort Sumter in Charleston Harbor. The attempt to relieve the fort brought on the bombardment and surrender (April 19, 1861). The Confederate States were now joined by Virginia, North Carolina, Arkansas, and Tennessee. Richmond was made the capital, and the Civil war opened.

Civil War between the Union and the Confederacy.—The line of separation between the states then became the Potomac River, the Ohio River, and a line across southern Missouri and Indian Territory to New Mexico. Along this line the troops of the Union were drawn up in many places under many commanders. Yet there were in the main but three great armies. That of the East or Potomac under General McClellan, that of the Center or the Ohio under General Buell, that of the West or Missouri under General Halleck. In command of all as Lieutenant-General was Winfield Scott. Confronting them were the troops of the Confederacy, drawn up in three corresponding armies: that of North Virginia under Johnston and Lee, that of the Cumberland under Albert Sidney Johnston, and that of the trans-Mississippi under McCulloch and Price.

Yielding to the demand of the North for the capture of Richmond before the Confederate Congress could meet there (July 20, 1861), McDowell went forth with thirty-eight thousand three-months volunteers to the ever memorable field of Bull Run.

The Union Successes in the Southwest.—But the serious campaigning did not begin until January, 1862. Then the whole line west of the Alleghanies (made up of the armies of Ohio and Missouri), turning on Pittsburgh as a center, swept southward, captured Forts Henry and Donelson, defeated the Confederates at Shiloh, captured Corinth, took Island Number 10, and drove them from Fort Pillow. Meantime Farragut entered the Mississippi from the Gulf, passed Forts Jackson and St. Philip, captured New Orleans, and sent Commodore Davis up the river to take Memphis. Memphis fell June 6, 1862, and, save for Vicksburg, the Mississippi was open for navigation. When the year closed the Confederates had been driven to the east into the mountains of Tennessee, where, December 31, 1862 to January 2, 1863, was fought the desperate and bloody battle of Murfreesboro. The Union troops won, and the Confederate army fell back to Chattanooga.

The Peninsular Campaign Favors Confederate Arms.—With the Army of the Potomac meantime all had gone ill. The affair at Bull Run in July, 1861, had been followed by the transfer of the army to McClellan. But McClellan wasted time, wore out the patience of the North, and forced Lincoln to issue General Order Number One for the forward movement of all armies on February 22, 1862. Obedient to this McClellan began his Peninsular Campaign against Richmond, was out-generaled by Lee, and in the second battle of Bull Run suffered so crushing a defeat that Lee ventured to cross the Potomac and enter Maryland, and encountered McClellan, on the field of Antietam. In that battle Lee was beaten and fled across the Potomac. But McClellan failed to follow up the victory and was removed, the command of the Army of the Potomac passing to Burnside. Burnside led it across the Potomac and the Rappahannock and on December 13, 1862, lost the battle of Fredericksburg. For this he was replaced by Hooker, who, May 1-4, 1863, fought and lost the battle of Chancellorsville.

The Turning Point of the War.—Lee now again took the offensive, crossed the Potomac, entered Pennsylvania, and at Gettysburg met the Army of the Potomac under Meade. On that field was fought the decisive battle of the war. Then (July 1-4, 1863) the backbone of the Confederacy was broken, and the two armies returned to their old positions in Virginia.

While Meade was beating Lee at Gettysburg, Grant captured Vicksburg, July 1-3, 1863. For this he was sent to command the army of Rosecrans, then besieged by Bragg at Chattanooga. Again success attended him, and in November he stormed Lookout Mountain, defeated Bragg in the famous "Battle above the Clouds," and drove him in disorder through the mountains. For these signal victories he was raised to the rank of Lieutenant General in 1864, and placed in command of the armies of the United States.

That year is memorable for the great march

of Sherman to the east from Chattanooga to the sea, for the victories of Sheridan in the valley of the Shenandoah, for the Wilderness Campaign of Grant, the shutting up of Lee in Richmond, and by the re-election of Lincoln. His competitor was General McClellan, whom the northern Democrats put forward on the platform that the war was a failure, and that peace should be made with the South. In the spring of 1865 came the retreat of Lee from Richmond, and, on April 9, his surrender at Appomattox Court House.

THE AMERICAN CIVIL WAR, 1861-1865

Causes of the War	Influencing Events	Results of the War
Real, but remote:	The invention of the cotton gin, 1793.	
(1) The doctrine of popular sovereignty. Different constructions of the Constitution.	Fugitive slave laws, 1793 and 1850. Protective tariff laws. Missouri compromise, 1820. Nullification act in South Carolina, 1832.	The Union was preserved.
(2) Slavery. Different systems of labor in the North and the South.	Annexation of Texas, 1845. Omnibus bill, 1850. Kansas-Nebraska bill, 1854. Dred Scott decision, 1857.	Slavery was abolished. Secession as a working program was shown to be impracticable.
(3) Lack of intercourse between the North and the South.	Personal liberty bills, 1857. John Brown raid, 1859.	The war cost the lives of nearly one million able-bodied men.
(4) The increase of territory.	Anti-slavery papers, books, and speeches. New England Anti-Slavery Society was organized, 1832.	The national debt was increased to $2,750,000,000.
Immediate: The secession of the states.	Anti-slavery parties: Liberty party, 1840-1848. Free-Soil party, 1848-1856. Republican party, 1854.	An incalculable amount of property was destroyed.

CAMPAIGNS AND BATTLES

Naval engagements are printed in *italics;* names of victorious commanders in **bold-face** type.

LAND AND SEA ENGAGEMENTS

Name, Location and Date of Battle	Commanders	Casualties			
		Union		Confederate	
		Killed	Wounded	Killed	Wounded
1861					
Bombardment of Fort Sumter (April 13-14)	**Gen. Beauregard** vs. Maj. Anderson	No cas	ualties	on eith	er side
Bull Run, Virginia (July 21)	**Gen. Beauregard** and **Gen. Johnston** vs. Gen. McDowell.	481	1,011	362	1,390
Wilson Creek, Missouri (August 10)	**Gen. Price** vs. Gen. Lyon.	223	721	331	764
1862					
Pea Ridge, Arkansas (March 6-8)	**Gen. Curtis** and **Gen. Franz Sigel** vs. Gen. Van Dorn.	203	972	1,040	3,638
Monitor and Merrimac, Hampton Roads, Virginia (March 9)	**Lt. J. L. Worden** vs. Capt. Franklin Buchanan	0	1	0	2
Fort Donelson, Tennessee (February 15)	**Gen. Grant** vs. Gen. Floyd, Gen. Pillow and Gen. Buckner.	560	746	466	1,534
Shiloh, or Pittsburg Landing, Tennessee (April 6-7)	**Gen. Grant** vs. Gen. Johnston and Gen. Beauregard.	1,735	7,882	1,128	8,012
Drury's Bluff, Virginia (May 15)	**Gen. Beauregard** vs. Gen. Butler.	422	2,380	514	1,086
Seven Pines, or Fair Oaks, Virginia (May 31)	**Gen. Johnston** vs. Gen. McClellan.	891	3,627	1,987	2,233
Gaines Mill, Virginia (June 27)	**Gen. A. Elzey** vs. Gen. F. J. Porter.	3,000	4,500	2,000	4,000
Malvern Hill, Virginia (July 1)	**Gen. McClellan** vs. Gen. Lee.	2,860	3,500	3,023	4,077
Cedar Mountain, Virginia (August 8-9)	**Gen. Jackson** vs. Gen. Banks.	450	660	223	1,060
Bull Run No. 2, or Manassas, Virginia, (August 29-30)	**Gen. Lee** and **Gen. Jackson** vs. Gen. Pope.	798	4,023	1,090	6,154
Antietam, Maryland (September 16-17)	**Gen. McClellan** vs. Gen. Lee.	2,010	9,416	1,842	9,399
Corinth, Mississippi (October 3-4)	**Gen. Rosecrans** vs. Gen. Van Dorn.	315	1,812	1,423	5,692
Perryville, Kentucky (October 8)	**Gen. Buell** vs. Gen. Bragg.	916	2,943	980	1,520
Fredericksburg, Virginia (December 11-13)	**Gen. Lee** vs. Gen. A. E. Burnside.	1,152	9,101	505	4,061
Murfreesboro, or Stone River, Tennessee (December 30, 1862, to January 2, 1863)	**Gen. Rosecrans** vs. Gen. Bragg.	1,533	7,245	1,384	6,892

THE AMERICAN CIVIL WAR, 1861-1865—Continued

Name, Location and Date of Battle	Commanders	Casualties			
		Union		Confederate	
		Killed	Wounded	Killed	Wounded
1863					
Chancellorsville, Virginia (April 30 to May 4)	**Gen. Lee** and **Gen. Jackson** vs. Gen. Hooker.	1,512	9,518	1,718	10,563
Vicksburg, Mississippi (May 19-25)	**Gen. Pemberton** vs. Gen. Grant.	1,848	2,378	1,420	2,151
Gettysburg, Pennsylvania (July 1-3)	**Gen. George G. Meade** vs. Gen. Lee.	2,834	13,709	4,000	14,000
Chickamauga, Georgia (September 18-20)	**Gen. Bragg** vs. Gen. Rosecrans.	1,644	9,262	6,000	10,000
Chattanooga, including Orchard Knob, Lookout Mountain and Missionary Ridge, Tennessee (November 23-25)	**Gen. Grant, Gen. Sherman** and **Gen. Hooker** vs. Gen. Bragg.	757	4,529	850	2,150
1864					
Wilderness, Virginia (May 5-7)	**Gen. Grant** vs. Gen. Lee.	2,309	12,188	1,956	10,444
Spottsylvania, Virginia (May 8-11)	**Gen. Grant** vs. Gen. Lee.	3,288	19,278	3,342	20,187
Spottsylvania, Virginia (May 18)	**Gen. Grant** vs. Gen. Lee.	2,031	7,956	1,752	7,248
Bermuda Hundreds, Virginia (May 26-30)	**Gen. Butler,** vs. Gen. D. H. Hill.	201	998	864	2,136
Cold Harbor, Virginia (June 2-3)	**Gen. Lee** vs. Gen. Grant.	1,905	10,570	364	1,336
Petersburg, Virginia (June 15-19)	**Gen. Lee** vs. Gen. Smith, Gen. Hancock and Gen. Burnside.	1,298	7,474	984	6,721
Petersburg, Virginia (June 20-30)	**Gen. Grant** vs. Gen. Lee.	112	506	801	1,417
Peach Tree Creek, Georgia (July 20)	**Gen. Thomas** vs. Gen. Hood.	301	1,411	880	3,916
Atlanta, Georgia, **Hood's First Sortie** (July 22)	**Gen. Logan** vs. Gen. Hood.	499	2,142	1,162	7,337
Petersburg, Virginia (from July 1, exclusive of losses at the Crater and Deep Bottom) (July 31)	**Gen. Grant** vs. Gen. Lee.	419	2,076	799	4,023
Petersburg, Virginia (August 1-31)	**Gen. Grant** vs. Gen. Lee.	87	484	101	605
Opequan, Virginia (September 19)	**Gen. Sheridan** vs. Gen. Early.	653	3,719	1,632	3,868
Cedar Creek, Virginia (October 19)	**Gen. Sheridan** vs. Gen. Early.	588	3,516	961	3,239
Fair Oaks, Virginia (October 27-28)	**Gen. McClellan** vs. Gen. Johnston.	120	783	150	301
Petersburg, Virginia (Sept. 1 to Oct. 30)	**Gen. Grant** vs. Gen. Lee.	170	822	240	761
Franklin, Tennessee (November 30)	**Gen. Hood** vs. Gen. Schofield.	189	1,033	1,141	5,113
Nashville, Tennessee (December 15-16)	**Gen. Thomas** vs. Gen. Hood.	399	1,741	584	3,021
1865					
Petersburg, Virginia (April 2)	**Gen. Grant** vs. Gen. Lee.	298	2,565	341	3,092
Appomattox, Virginia (April 9)	**Gen. Grant** vs. Gen. Lee.	203	297	189	386

Lincoln Assassinated, and Beginning of Reconstruction.—On April 14, 1865, Lincoln was assassinated and Andrew Johnson became president. With the succession of Johnson the era of reconstruction, political and social, begins. The outcome of political reconstruction was the thirteenth, fourteenth, and fifteenth amendments to the Constitution of the United States, the impeachment of Andrew Johnson, and a long list of acts to protect and assist the freedmen of the South. The outcome of social reconstruction was the rise of the Ku Klux Klan, the passage and use of the Force Act, and the dreadful condition of affairs which ruined the South for a decade.

In the North the effect of such measures was to split the Republican party and put seven presidential candidates in the field in 1872. One represented the Temperance party; another the Labor party, denouncing Chinese labor and the non-taxation of Government land; a third was the Liberal Republican, demanding union, amnesty, and civil rights, accusing Grant of packing the Supreme Court in the interests of corporations, and calling for a repeal of the Ku Klux laws. The Liberal

Republicans having chosen Horace Greeley as their candidate, the Democrats accepted and indorsed him. But he pleased neither party, and the discontented Liberals and the discontented Democrats each chose a candidate of their own. The Republicans nominated Grant and elected him.

Election of Hayes Decided by an Electoral Commission.—His second term (1873-1877) was the nadir of our politics, both state and national, and ended with the disputed election and the rise of the Independent or "Greenback party," demanding the repeal of the act for the resumption of specie payments and the issue of the United States "greenback" notes, convertible into bonds, as the currency of the country. Double returns and doubtful returns from the Southern states put the votes of thirteen electors in dispute. As the House was Democratic and the Senate Republican, the joint rule under which the electoral votes had been counted since 1865 could not be adopted. A compromise was necessary, and on January 29, 1877, the Electoral Commission of five Senators, five Representatives, and five judges of the Supreme Court was created to decide on the doubtful returns. Of the fifteen, eight were Republicans and seven Democrats, and by a strict party vote the thirteen electoral votes were given to the Republicans and Rutherford B. Hayes declared elected.

Resumption of Specie Payments by the Government.—The memorable events of his term (1877-1881) were the resumption of specie payments on January 1, 1879; the passage of the Bland Silver Bill, restoring the silver dollar to the list of coins, making it legal tender, and providing for the coinage of not less than two million nor more than four million each month; and the rapid growth of the National or Greenback Labor party. Hayes was followed in 1881 by James A. Garfield, whose contest with the Senators from New York over the distribution of patronage led to his assassination by the hand of a crazy applicant for office. Chester A. Arthur then became President, was followed in 1885 by Grover Cleveland, who was succeeded in 1889 by Benjamin Harrison, who was in turn succeeded in 1893 by Grover Cleveland.

The presidential campaign of 1896 was one of the most exciting and important that has ever taken place. It was a contest respecting principles, and party platforms never received more attention. The amount of financial and political literature distributed and read was enormous, and political speeches, almost without number, were delivered. The coöperation of very many gold standard Democrats greatly increased the Republican strength and McKinley and Hobart were elected by a large majority of the electoral votes and by a plurality of over six hundred thousand of the popular vote.

McKinley and the Spanish-American War.—The administration of President McKinley was notable in many respects, and marked a new era in the foreign policy of the United States. Chief of the events was the Spanish-American war, which was precipitated in 1898, largely through the cruel treatment of the Cuban people by the mother country, Spain. Public opinion in the United States had been much divided in regard to the Cuban difficulties, but the division was in no sense sectional and a majority believed that war was not only justifiable but inevitable.

On February 15, 1898, the United States battleship *Maine* was destroyed in Havana harbor, and many believed this to have been the work of the Spaniards. Thereupon a congress was held, and a resolution passed demanding the withdrawal of Spain from Cuba. But before the message could be delivered, the American minister in Madrid received his passports and the Spanish government declared war. On April 22, Rear-Admiral Sampson began the blockade of Havana and the northern coast of Cuba with his North Atlantic squadron.

Meanwhile Dewey, who had been stationed at Hong-Kong with the American squadron, was ordered to begin operations, and sailed to Manila Bay in the Philippines. He entered Manila Bay early Sunday morning, May 1, 1898. The Spanish fleet lying in the harbor was protected by the guns of the batteries at Cavité, a few miles from Manila.

The Spaniards knew that he had left Hong-Kong, but he came sooner than he was expected and caught them unawares. He had planned to do this so that he might choose his own time for attack. As soon as he reached Manila Bay he opened upon the Spanish fleet a terrible fire of shot and shell. His fire was answered vigorously from the war vessels and the shore batteries, but the guns of the enemy were not well aimed and their shot did little damage. After a sharp fight of about two hours Dewey withdrew his fleet, in order, it is said, to give his men time for breakfast, but more likely to see how his ammunition was holding out.

After three hours he returned to the attack. By this time most of the Spanish vessels were in flames. An hour later the Spanish batteries "were silenced and the ships sunk or burned and deserted." In the conflict the Spaniards lost every vessel and hundreds of men were killed, wounded, and missing. No American was killed and but seven wounded; while no American vessel was seriously damaged.

The battle of Manila is one of the great naval actions of history; never before had so much been won with so little loss of life and ships. Congress made Dewey a Rear Admiral, gave him a vote of thanks, and voted him a sword. Soon after the war he was made Admiral, the highest rank in the navy.

About the same time the Spanish Admiral, Cervera, had left the Cape Verde Islands en route for Santiago, where he arrived on May 19. Strict watch was kept by Sampson to prevent the escape of the enemy, and the *Merrimac* was sunk at night to block the Spanish squadron in the harbor, but the ship drifted too far to prevent Cervera's exit. This difficult feat was intrusted to Ensign Richmond P. Hobson and six men. They performed their dangerous task, notwithstanding a severe fire from the Spanish land batteries. They were captured, but Admiral Cervera was so moved by their bravery that he sent word to the Americans that they were safe and would be well treated.

SUMMARY OF SPANISH-AMERICAN WAR, 1898

Causes

Underlying:

Sympathy for the oppressed Cubans. The "reconcentrados," people driven into the towns by Weyler, died by thousands, and Americans who aided them are arrested and their property destroyed.

The proximity of Cuba and its geographical position make its situation of great importance to the United States.

Destruction of American property.

Publication of a letter of the Spanish Minister, in which he speaks slightingly of President McKinley.

Immediate:

The blowing up of the battleship *Maine.*

Treaty and Results

The Treaty of Paris, December 10, 1898, stipulated as follows:

Spain gives up title to Cuba.

Spain cedes Porto Rico, Guam and the Philippines to the United States.

The United States gives Spain $20,000,000.

The direct cost of the war to the United States is about $130,000,000.

Soldiers killed, 430. A large number die of disease.

The United States becomes the guardian of Cuba.

An increase in our navy and standing army.

The war in the Philippines.

The question of territorial expansion in our politics.

LAND AND SEA ENGAGEMENTS

Name, Location and Date of Battle	Commanders	Casualties			
		United States		Spanish	
		Killed	Wounded	Killed	Wounded
THE ARMY					
Guantanamo (June 11-20, 1898)	.....	6	16	....	....
Bombardment of Santiago (June 22, 1898)	.....	....	....	....	....
Las Guasimas, Cuba (June 24, 1898)	**Gen. Wheeler** vs. Gen. Linares.	16	50	28	124
El Caney, Cuba (July 1, 1898)	**Gen. Lawton** and **Gen. Chaffee** vs. Gen. Vara de Rey.	88	356	120	400
San Juan, Cuba (July 1-3, 1898)	.....	151	1,007	204	1,340
Santiago, Cuba (July 10-12, 1898)	**Gen. Shafter.**	2	13	....	....
Santiago Campaign (June 21 to July 17, 1898)	**Gen. Shafter** vs. Gen. Toral.	260	1,341	....	....
Porto Rico Campaign (July 25-28, 1898)	**Gen. Miles.**	3	40	....	....
The Reduction of Manila (August 13, 1898)	**Gen. Merritt**	17	106	....	....
THE NAVY					
Manila Bay, Philippine Islands (May 1, 1898). American Vessels: *Olympia, Baltimore, Raleigh, Boston, Concord, Petrel.* Spanish Vessels: *Reina Cristina, Castella, Don Antonio de Ulloa, Isla de Luzon, Isla de Cuba, General Lezo, Marquis de Duero, Cano Velasco, Isla de Mindanao, Sandoval, José Garcia, Leyte* and torpedo boat *Barcelona.*	American Commander: **Geo. Dewey.** Spanish Commander: Admiral Montijo.	American Casualties: Seven men slightly injured. No damage to ships. Spanish Casualties: All ships destroyed, 450 men killed and wounded.			
Bombardment of Cienfuegos, Cuba (May 11, 1898).	By torpedo boat *Winslow.*	1	11	....	....
Bombardment of San Juan (May 12, 1898)	**Admiral Sampson.**	1	7	....	....
Before Santiago (July 3, 1898) American Vessels: *Brooklyn, Texas, Oregon, Iowa, Gloucester.* Spanish Vessels: *Almirante, Oquendo, Christobal Colon, Vizcaya, Infanta Maria Teresa,* and torpedo boats *Pluton* and *Furor.*	American Commander: **Winfield Schley.** Spanish Commander: Admiral Cervera.	American Casualties: One man killed. *Brooklyn* struck thirteen times, *Texas* once, but neither badly damaged. Spanish: All ships destroyed, more than 600 men killed and wounded, and rest surrendered.			

The total number of vessels captured from Spain during the war of 1898 was 58.

On June 21, Major-General Shafter arrived off Santiago and successfully landed his troops at Baiquiri, and three days later the Spaniards were driven back from Sevilla. General Shafter then began his attack on Santiago, whither the Spaniards had retreated. Operations began on July 1. The severest fighting took place at San Juan Hill and El Caney, a garrisoned post, where a body of five hundred Spaniards offered a desperate resistance for some hours. By sundown the hills on which the enemy were posted, including San Juan, were occupied by the Americans. The attacking force consisted of regular infantry and dismounted cavalry, with an irregular corps of mounted men known as the Rough Riders. The latter, under the command of Colonels Leonard Wood and Roosevelt, took a prominent part in the fight. On July 4 the city was summoned to surrender, but without success. In the meanwhile Admiral Cervera's squadron had been ordered to sea by the Madrid government. He accordingly left Santiago harbor the same day at nine a. m. with the object of

effecting its escape by keeping close to the western shore. The American fleet, temporarily under Schley's command, at once engaged the Spaniards, and by two o'clock succeeded in burning, beaching, or capturing all the enemy's vessels. After this Santiago surrendered, July 17, and Spain sued for peace. It was arranged that Spain should evacuate Cuba, should cede Porto Rico to the United States, as well as her islands in the Antilles, and one of the Ladrones, and should leave the United States in the possession of Manila. In 1899 a treaty was signed, and Spain evacuated Cuba, the Philippines, and other islands for an indemnity of twenty million dollars.

Insurrection in the Philippine Islands.—A day or two after the final vote on the treaty a body of Philippines under Amilio Aguinaldo, a native of great ability, attacked the American defenses at Manila. The next day the Americans returned the attack, and for nearly a year there was a resistance to the American rule on the part of the tribes which Aguinaldo represented. These tribes belonged to the Tagals, a Malay race. They are in a minority as regards the whole population, but are among the most intelligent. By the close of the year 1899 the organized resistance on the part of the Tagals appeared to be nearly ended, and the army of Aguinaldo reduced to marauders and bandits, and the insurrection against the authority and sovereignty of the United States was ended in July, 1902, after the capture and surrender of the insurgent leader.

Assassination of McKinley and Succession of Roosevelt.—Shortly after his re-election to a second term, on September 6, 1901, the country was shocked by the assassination of President McKinley by an anarchist named Czolgosz. This was the third time in the history of the country that the chief executive was stricken down by the hand of an assassin. The Vice-President, Theodore Roosevelt, then succeeded to the presidency and continued, in all essential details, the policy of his lamented predecessor.

Under President Roosevelt, a champion of administrative reform and the regulation of commercial trusts, the status of Cuba was settled; progress was made in the Philippines; the navy was very greatly strengthened; the Isthmian Canal question was solved in favor of the Panama route, and the Republic of Panama recognized; and the President reasserted with emphasis the Monroe Doctrine as the key to foreign policy. The Alaska boundary was fixed by a mixed commission. The United States took part with the European powers in armed intervention at Peking in 1899; and an arbitration treaty with Great Britain and other countries was arranged for.

In a second term (1905-1909) President Roosevelt maintained his popularity by the same policy. In 1906 an insurrection broke out in Cuba, and in October American troops again took possession of the island. When confidence had been restored the United States authorities withdrew.

President Taft and the Rise of the Progressives.—In 1908 the Republican, Taft, defeated Bryan, the Democratic candidate. Mr. Roosevelt had refused to be a candidate again and was instrumental in securing Mr. Taft's nomination. President Taft was elected on a Rooseveltian programme of anti-trust legislation and promises of a reduced tariff. In 1910-1911 attempts were made at a Reciprocity of Duties Treaty with Canada, so as to establish freer trade between the two countries. The Canadian general election of 1911 gave an emphatic negative to the proposal.

During the latter part of 1912 a renewed insurrection in Mexico brought about strained diplomatic relations with that country.

In Ohio, Minnesota, and Indiana, however, Democratic governors were elected, and these results pointed to a political reaction in the West, largely owing to supposed inequities in the tariff and to the dominance of trusts.

In 1910 an "insurgent" or progressive section, to which Mr. Roosevelt adhered, formed itself within the Republican party; and the state elections in November resulted in a Democratic triumph without a parallel since that of the year 1890.

Democrats Restored to Power under Leadership of Woodrow Wilson.—In 1912 Woodrow Wilson won the presidency on a Democratic programme, having a clear majority over the two Republican ex-presidents (Roosevelt and Taft) opposed to him. His election was fought chiefly on the tariff question, his main argument being that some industries were receiving unfair protection at the expense of others.

On May 31, 1913, shortly after the inauguration of President Wilson the Seventeenth Amendment to the Constitution of the United States, providing for the direct election of Senators by the people of the states, instead of by their respective legislatures, became effective. On October 3, of the same year, the Underwood Tariff Act became a law. Following this, on December 23, the Currency and Banking Bill, providing regional reserve banks throughout the country, was signed.

In 1914 the continued insurrectionary conditions in Mexico led to the seizure of the custom house at Vera Cruz by a United States fleet, resulting in an American loss of eighteen marines killed and seventy wounded. Subsequently diplomatic representatives of the republics of Argentina, Brazil, and Chile (popularly known as the "A B C powers") offered their services as mediators, were accepted by the United States and the troops withdrawn. The temporary lull, however, thus brought about was soon succeeded by a series of struggles between the provisional Mexican government and the insurrectionists, led by Francisco Villa, which have ever since continued with little abatement. In 1916 the border raids of the Mexican bandits resulted in so many outrages upon American lives and property that the President was compelled to order United States troops to the Rio Grande for the protection of our citizens, and finally a detachment under General Pershing was sent into Mexican territory.

The important La Follette Seaman's bill, to promote the welfare of American seamen and provide for their safety at sea, was approved

PRESIDENT WILSON LEAVING THE EXECUTIVE OFFICES

March 4, 1915; and, in the same year (February 20), the Panama-Pacific Exposition was opened at San Francisco. On November 12, the United States assumed a protectorate of the Republic of Hayti.

During 1916 the Republic of Santo Domingo likewise passed under an American protectorate and the Rural Credits Bill became a law, whereby a system of Farm Loan Banks was created.

From the very beginning of the European war the administration of President Wilson was brought face to face with numerous intricate and several critical diplomatic situations growing out of that titanic conflict. The relationship of the United States, as a neutral nation, to the belligerent countries engaged in this war gave rise to more difficult and significant issues than any other president was compelled to meet since the time of Lincoln, if indeed, it has not been unprecedented in our entire history.

President Wilson Re-elected and His Policies Approved.—At the national election, in November, 1916, President Wilson was re-elected over his opponent, Charles E. Hughes. Following his re-election (December, 1916) the President proffered the services of this government to the belligerent powers of Europe in an effort to re-establish peace between these great contending coalitions. In spite of foreign complications, the year 1916 closed a period of unparalleled industrial and commercial prosperity for the United States, and more than ever confirmed its position as a great world power, with an immense field of new possibilities and corresponding duties.

On January 2, 1917, Congress re-assembled and began the consideration of important questions of national defense, railroads, and foreign policy growing out of the European war. In February, diplomatic relations were severed by the United States with Germany, and was succeeded in March by a declaration of armed neutrality on the part of our government.

Meanwhile great activity characterized all departments of the national government along lines of military preparedness, supported by unprecedented appropriations by Congress.*

The supreme national industrial event of the Wilson administration, however, was the opening of the Panama Canal for navigation on August 14, 1914, and its use since that time as an instrumentality of world traffic.

PANAMA CANAL.—This gigantic engineering project was designated by Count de Lesseps, of France, in 1879, and actual work began by the French Panama Canal Company, in 1881. Negotiations extending from 1901 to 1904 resulted in the taking over of the holdings of the French company by the United States, and work was started by United States government engineers in May of the latter year. Since that time the project has been steadily carried forward to completion.

The Canal is about fifty miles in length from deep water in the Caribbean Sea to deep water in the Pacific Ocean. The channel ranges in width from three hundred to one thousand feet. The average bottom width of the channel in this project is six hundred and forty-nine feet, and the minimum width is three hundred feet. The Canal has a minimum depth of forty-one feet.

Harding Elected President.—The presidential and congressional elections in November, 1920, turned very largely on policies and issues growing out of the World war. The results were overwhelmingly Republican. Warren G. Harding, Republican, was elected President over James M. Cox, Democrat, and both branches of Congress returned large Republican majorities. Harding and Coolidge became President and Vice-President, March 4, 1921.

* See the supplement entitled "Book of the War," for additional details concerning the entrance of the United States into the European War, the chief events of that war, its conclusion and the peace conference immediately following.

CONTOUR MAP OF THE PANAMA CANAL AND CONNECTIONS

This map shows the general direction of the canal to be north and south; how it is brought into direct communication with the ports of the United States; and how it facilitates shipping to all parts of the world.

TABLE OF STATE AND TERRITORIAL GOVERNMENT

The ratification of the Nineteenth Amendment to the Federal Constitution, August 18, 1920, extended equal suffrage to women. The Amendment reads as follows: "*Sec. 1* — The right of citizens of the United States to vote shall not be denied or abridged by the United States, or any state, on account of sex. *Sec. 2* — Congress shall have power, by appropriate legislation, to enforce the provisions of this article."

States and Popular Name	Requirements as to Citizenship Persons Excluded from Suffrage (*in italic*)	Previous Residence Required				Governors		Legislatures			Members' Terms		Electoral Vote, 1916
		In State	In Co.	In Town	In Precinct	Salaries	Length Term Years	Ann. or Bien.	Limit of Session	Salaries of Members	Senators	Representatives	
Alamaba 'Lizard"	Citizen of United States or alien who has declared intention. *Convicted of treason or other felonies, idiots, vagrants, insane.*	2 years	1 year	3 mos.	3 mos.	$ 7,500	4	Quad.	50 days	$4.00 per diem	4	4	12
Alaska	Citizen of the United States, male or female. *Aliens and Indians.*	1 year	.....	30 days	30 days	7,000	4	Bien.	60 days	$15.00 per diem	4	2	0
Arizona	Citizen of the United States, male or female. *Idiot, insane, felon* (b).*	1 year	30 days	30 days	30 days	6,500	2	Bien.	60 days	$7.00 per diem	2	2	3
Arkansas "Bear"	Citizen of the United States or alien who has declared intention. *Idiots, insane, convicted of felony, failure to pay poll tax.*	1 year	6 mos.	30 days	30 days	4,000	2	Bien.	60 days	$6.00 per diem	4	2	9
California "Golden"	Citizen, male or female, by nativity, naturalization 90 days prior to election (*d*). *Idiots, insane, embezzlers of public moneys, convicted of infamous crime.**	1 year	90 days	.....	30 days	10,000	4	Bien.	None	$1,000 term	4	2	13
Colorado "Centennial"	Citizen, native or naturalized, male or female. *Felons, insane.*	1 year	90 days	30 days	10 days	5,000	2	Bien.	90 days	$1,000 term	4	2	6
Connecticut "Nutmeg"	Citizen of the United States. *Convicted of heinous crime.*	1 year	.....	6 mos.	.....	5,000	2	Bien.	None	$300 term	2	2	7
Delaware "Diamond"	Citizen of the United States. *Insane, paupers, felons.**	1 year	3 mos.	.....	30 days	4,000	4	Bien.	60 days	$5.00 per diem	4	2	3
Dist. of Col.	See foot note on following page.	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	0
Florida "Flower"	Citizen of the United States. *Idiots, duelists, felons.*	1 year	6 mos.	6 mos.	6 mos.	6,000	4	Bien.	60 days	$6.00 per diem	4	2	6
Georgia "Cracker"	Citizen of the United States. *Felons, idiots and insane.*	1 year	6 mos.	.....	.....	5,000	2	Ann.	50 days	$4.00 per diem	2	2	14
Hawaii	Citizen of the United States. *Idiots, insane, felons (j).*	1 year	.....	.....	3 mos.	7,000	4	Bien.	60 days	$600 session	4	2	0
Idaho	Citizen of the United States, male or female. *Idiots, insane, felons, bigamists.*	6 mos.	30 days	.....	.....	5,000	2	Bien.	60 days	$5.00 per diem	2	2	4
Illinois "Prairie"	Citizen of United States *Convicted of crime.*	1 year	90 days	30 days	30 days	12,000	4	Bien.	None	$3,500 annum	4	2	29
Indiana "Hoosier"	Citizen of the United States or alien who has declared intention (*g*). *Convicted of infamous crime. (b)*	6 mos.	.....	60 days	30 days	8,000	4	Bien.	61 days	$6.00 per diem	4	2	15
Iowa "Hawkeye"	Citizen of United States *Idiots, insane, felons.*	6 mos.	60 days	10 days	10 days	5,000	2	Bien.	None	$1,000 session	4	2	13
Kansas "Sunflower"	Citizen of the United States, male or female, or alien who has declared intention. *Convicted of treason or felony, insane.*	6 mos.	30 days	30 days	10 days	5,000	2	Bien.	50 days	$3.00 per diem	4	2	10
Kentucky "Blue Grass"	Citizen of United States *Felons, idiots and insane.*	1 year	6 mos.	.....	60 days	6,500	4	Bien.	60 days	$10.00 per diem	4	2	13
Louisiana "Creole"	Citizen of United States *Idiots, insane, felons.**	2 years	1 year	.....	6 mos.	7,500	4	Bien.	60 days	$5.00 per diem	4	4	10
Maine "Pine Tree"	Citizen of the United States. *Paupers, insane, Indians.*‡*	3 mos.	3 mos.	3 mos.	3 mos.	5,000	2	Bien.	None	$300 annum	2	2	6
Maryland "Old Line"	Citizen of the United States. *Felons, lunatics, bribers.*	1 year	6 mos.	6 mos.	1 day	4,500	4	Bien.	90 days	$5.00 per diem	4	2	8
Massachusetts "Bay"	Citizen *Paupers*.*	1 year	6 mos.	6 mos.	6 mos.	10,000	2	Ann.	None	$1,500 annum	1	1	18
Michigan "Wolverine"	Citizen of the United States or alien who declared intention two years and six months prior to November 8, 1894 *Indians with tribal relations.*	6 mos.	20 days	20 days	20 days	5,000	2	Bien.	None	$800 annum	2	2	15
Minnesota "North Star"	Citizen of United States *Felons, insane, Indians.‡*	6 mos.	30 days	30 days	30 days	7,500	2	Bien.	90 days	$1,000 session	4	2	12
Mississippi "Bayou"	Citizen of the United States. *Insane, idiots, Indians not taxed, felons, bigamists.**	2 years	1 year	1 year	1 year	5,000	4	Bien.	None	$500 session	4	4	10
Missouri	Citizen of the United States or alien who has declared intention. *Felons (b).*	1 year	60 days	60 days	.....	5,000	4	Bien.	70 days	$5.00 per diem	4	2	18

Note.—Residents of the District of Columbia never had the right to vote therein for national officers, or on other matters of national concern after the territory embraced in it was ceded to the United States and became the seat of the general Government.

*Or persons unable to read and write in English. †Or citizens of Mexico who desire to become citizens of Arizona under treaties of 1848 and 1854. ‡Indians who have not severed tribal relations.

TABLE OF STATE AND TERRITORIAL GOVERNMENT—Continued

States and Popular Name	Requirements as to Citizenship Persons Excluded from Suffrage (*in italic*)	Previous Residence Required				Governors		Legislatures			Members' Terms		Electoral Vote, 1916
		In State	In Co.	In Town	In Precinct	Salaries	Length Term Years	Ann. or Bien.	Limit of Session	Salaries of Members	Senators	Representative	
Montana "Mountain"	Citizen of the United States, male or female. *Felons, idiots, insane‡ (b).*	1 year	30 days	.....	.....	5,000	4	Bien.	60 days	$10.00 per diem	4	2	4
Nebraska	Citizen of the United States or alien who has declared intention *Felons, insane.*	6 mos.	40 days	10 days	10 days	2,500	2	Bien.	60 days	$10.00 session	2	2	8
Nevada "Silver"	Citizen of the United States, male or female. *Idiots, insane, felons.*	6 mos.	30 days	30 days	30 days	7,000	4	Bien.	60 days	$600 term	2-4	2	3
New Hampshire "Granite"	Citizen of United States *Paupers, insane, idiots, felons.*	6 mos.	6 mos.	6 mos.	6 mos.	3,000	2	Bien.	None	$200 term	2	2	4
New Jersey "Jersey Blue"	Citizen of the United States. *Idiots, paupers, insane, felons (b).*	1 year	5 mos.	.....	.....	10,000	3	Ann.	None	$500 annum	3	1	14
New Mexico	Citizen of United States *Idiots, insane, felons.†*	1 year	90 days	.....	30 days	5,000	5	Bien.	60 days	$5.00 per diem	4	2	3
New York "Empire"	Citizen who shall have been a citizen for ninety days prior to election.	1 year	4 mos.	30 days	30 days	10,000	2	Ann.	None	$1,500 annum	2	1	45
North Carolina "Old North"	Citizen of the United States. *Idiots, lunatics, felons.*	2 years	6 mos.	4 mos.	4 mos.	5,000	4	Bien.	60 days	$4.00 per diem	2	2	12
North Dakota "Sioux"	Citizen of United States *Felons, insane, tribal Indians.*	1 year	6 mos.	90 days	90 days	5,000	2	Bien.	60 days	$5.00 per diem	4	2	5
Ohio "Buckeye"	Citizen of United States *Idiots, insane, and felons (b).*	1 year	30 days	20 days	20 days	10,000	2	Bien.	None	$1,000 annum	2	2	24
Oklahoma "Sooner"	Citizen of United States *Felons, idiots, insane*‡.*	1 year	6 mos.	.....	30 days	4,500	4	Bien.	60 days	$6.00 per diem	4	2	10
Oregon "Sunset"	Citizen of the United States, male or female, or alien who declared intention more than one year prior to election. Property. *Idiots, insane, convicted of felony, U. S. soldiers and sailors.*	6 mos.	30 days	.....	30 days	5,000	4	Bien.	40 days	$3.00 per diem	4	2	5
Pennsylvania "Keystone"	Citizen of the United States at least one month. *Felons, non-taxpayers.*	1 year	.....	.....	2 mos.	10,000	4	Bien.	None	$1,500 session	2	2	38
Porto Rico	Citizen of United States *(f).* *Felons, insane (b).*	1 year	.....	1 year	.....	8,000	4	Ann.	60 days	$5.00 per diem	4	2	0
Rhode Island "Little Rhody"	Citizen of the United States. *Paupers, lunatics, felons.*	2 years	.....	6 mos.	.....	3,000	2	Ann.	60 days	$5.00 per diem	2	2	5
South Carolina "Palmetto"	Citizen of United States *(h).* *Felons, insane, paupers.*	2 years	1 year	4 mos.	4 mos.	3,000	2	Ann.	40 days	$200 term	4	2	9
South Dakota "Coyote"	Citizen of the United States or alien who has declared intention. *Insane, felons, U. S. soldiers, seamen and marines.*	6 mos.	30 days	10 days	10 days	3,000	2	Bien.	60 days	$5.00 per diem	2	2	5
Tennessee "Volunteer"	Citizen of the United States. *Felons, failure to pay poll tax.*	1 year	6 mos.	.....	.....	4,000	2	Bien.	75 days	$4.00 per diem	2	2	12
Texas "Lone Star"	Citizen of the United States or alien who has declared intention. *Idiots, lunatics, felons, U. S. soldiers, marines and seamen.*	1 year	6 mos.	6 mos.	.....	4,000	2	Bien.	90 days	$5.00 per diem	4	2	20
Utah	Citizen of the United States, male or female. *Idiots, insane, felons (b).*	1 year	4 mos.	.....	60 days	6,000	4	Bien.	60 days	$4.00 per diem	4	2	4
Vermont "Green Mountain"	Citizen of the United States. *Those lacking approbation of local board of civil authority.*	1 year	3 mos.	3 mos.	3 mos.	2,500	2	Bien.	None	$4.00 per diem	2	2	4
Virginia "Old Dominion"	Citizen of the United States. *Idiots, lunatics, paupers (b) (i).*	2 years	1 year	1 year	30 days	5,000	4	Bien.	60 days	$500 session	4	2	12
Washington "Evergreen"	Citizen of the United States, male or female. *Idiots, lunatics, felons.‡*	1 year	90 days	30 days	30 days	6,000	4	Bien.	60 days	$5.00 per diem	4	2	7
West Virginia "Panhandle"	Citizen of the United States. *Idiots, lunatics, felons.*	1 year	60 days	60 days	.....	5,000	4	Bien.	45 days	$4.00 per diem	4	2	8
Wisconsin "Badger"	Citizen of United States *Insane, felons, tribal Indians.*	1 year	.....	10 days	10 days	5,000	2	Bien.	None	$500 annum	4	2	13
Wyoming	Citizen of the United States, male or female. *Idiots, insane, felons, unable to read State Constitution.*	1 year	60 days	10 days	10 days	4,000	4	Bien.	40 days	$8.00 per diem	4	2	3

(*b*) Also soldiers, sailors and marines in United States service. (*d*) Or by Queretaro treaty. (*f*) Males born in Porto Rico who formally renounced allegiance to a foreign power. (*g*) One year's residence in the United States prior to election is required. (*h*) Who has paid six months before election all taxes then due, and can read and write any section of the State Constitution, or can show that he owns and has paid all taxes due the previous year on property in the State assessed at $300 or more. (*i*) Failure to pay poll tax. (*j*) Or those unable to speak, read and write the English or Hawaiian language.

GOVERNMENTS OF THE UNITED STATES, BRITISH EMPIRE,

UNITED STATES

Form of Government: Republic. The general plan of the government of the United States is determined by the Constitution. The central government is limited to the exercise of the powers specifically enumerated in the Constitution, or implied therein, while the remaining governmental powers, not denied to the states by the Constitution, are reserved to the states. The general government is in three fairly well defined parts, the legislative, executive, and judicial.

I. Constitution.—The present Constitution was adopted September 17, 1787.

Ratification of the Constitution.—The Constitution was ratified by the thirteen original States in the following order:

Delaware, Dec. 7, 1787, unanimously.
Pennsylvania, Dec. 12, 1787, vote 46 to 23.
New Jersey, Dec. 18, 1787, unanimously.
Georgia, Jan. 2, 1788, unanimously.
Connecticut, Jan. 9, 1788, vote 128 to 40.
Massachusetts, Feb. 6, 1788, vote 187 to 168.
Maryland, April 28, 1788, vote 63 to 12.
South Carolina, May 23, 1788, vote 149 to 73.
New Hampshire, June 21, 1788, vote 57 to 46.
Virginia, June 25, 1788, vote 89 to 79.
New York, July 26, 1788, vote 30 to 28.
North Carolina, Nov. 21, 1789, vote 193 to 75.
Rhode Island, May 29, 1790, vote 34 to 32.

Amendments.—Congress may, by two-thirds vote of both Houses, propose amendments to the Constitution, or upon application of the Legislatures of two-thirds of the several States, shall call a convention for proposing amendments, which, in either case, must be ratified by the Legislatures of three-fourths of the several States, or by conventions in three-fourths thereof.

II. The President.

How Elected.—The several steps in the election of the President are:

State Electors are chosen at a General Election held on the *Tuesday following the first Monday of November* of every fourth year; the number of Electors of each State being equal to the number of Senators and Representatives to which the State is entitled in Congress.

The Electors meet in their respective States on the *second Monday in January* following their election, and vote by ballot for President and Vice-President; and at the same time make certificates of their vote and transmit the same to the President of the Senate.

The Senate and House of Representatives meet together on the *second Wednesday of February* next ensuing, and count the votes of the State Electors, when, if there is an election, the President of the Senate declares who is elected President and Vice-President.

In case there is no choice by the State Electors, the President is elected by the House of Representatives from the three candidates who received the most electoral votes for President; in which election the vote is taken by States, each State having but one vote, and a majority of all the States being necessary to a choice.

Term of Office.—Four years.

Eligibility.—A natural born citizen; resident of the United States fourteen years; minimum age thirty-five years.

BRITISH EMPIRE

Form of Government.—Monarchy in form, but republic in practice. The monarchy is constitutional and limited.

The British Empire consists of the United Kingdom of Great Britain and Ireland, the Empire of India, and the British Dominions beyond the Seas, including the self-governing Dominions, and the Crown Colonies, Protectorates, and other Dependencies, the whole forming one Empire.

I. Constitution.—The British Constitution is mainly unwritten and customary, but its development is marked by certain outstanding and fundamental laws, of which the principal are: Magna Charta, 1215; the Habeas Corpus Act, 1679; the Act of Settlement, 1701; the Act of Union with Scotland, 1707; the Act of Union with Ireland, 1800: and the Parliament Act, 1911. The first secured annual parliaments and the equal administration of justice; the second established the liberty of the person; the third provided for the Protestant succession to the throne; the fourth and fifth created the United Kingdom; and the last enabled the Commons to pass certain Acts without the adherence of the other Chamber.

II.. The Sovereign.

How Designated.—The King's legal title rests upon the Act of Settlement, in 1701, under William III., by which the succession to the Crown of Great Britain and Ireland was settled on the Princess Sophia of Hanover and the "heirs of her body, being Protestants." The throne is hereditary in the English house of Saxe-Coburg-Gotha with mixed succession, the sons of the Sovereign and their descendants having precedence of daughters, but daughters and their descendants preference over lateral lines. The Sovereign is designated King (or Queen) of Great Britain and Ireland, and Emperor (or Empress) of India.

Term of Office.—Holds office for life, by hereditary title, and cannot be removed.

GERMANY, AND FRANCE ARRANGED IN PARALLEL COLUMNS

GERMANY

Form of Government. — Germany, according to the Constitution of July 31, 1919, is a Federated Republic, bearing the name German Republic, under the elective presidentship of the whole German people.

I. Constitution.

Adoption. — Present Constitution adopted July 31, 1919. The Constitution was adopted by the National Assembly at Weimar, and became the basic law of the German Republic on August 13, 1919.

Amendments. — Amendments to the Constitution can be proposed by either of the legislative bodies, and be passed by ordinary legislative process, requiring for their passage a two-thirds majority of the votes of the Reichstag and National Council; or, may be determined by a majority vote of qualified voters through a referendum.

II. Chief Magistrate, styled the National President.

Term of Office. — Holds office for seven years, and may be re-elected.

Qualifications. — Every German who has completed his thirty-fifth year. Other details may be enacted by national legislation.

FRANCE

Form of Government. — France, since the overthrow of Napoleon III., in 1870, has been a republic governed by a President and two Chambers under the Constitution.

I. Constitution.

Adoption. — Present Constitution adopted February 25, 1875. It has undergone but slight modifications. The present French Constitution remains a mixture of monarchical and republican institutions, and it has fully maintained its strong and old-established centralization. The Constitution of 1875 is based on universal suffrage. It was revised in 1875, 1884, 1885 and 1889.

Amendments. — Whenever the two Houses agree that revision is necessary, and also agree upon particular points that should be revised, the National Assembly, composed of the Senate and the Chamber of Deputies, sitting as one body, convenes at Versailles, and acts upon the amendments proposed, the vote of an absolute majority being decisive. The National Assembly also elects the President of the republic.

II. Chief Magistrate or President of the Republic.

Term of Office. — Elected for seven years by the National Assembly, and is re-eligible.

The National Assembly meets for the purposes of this election, as for the revision of the Constitution, at Versailles. The revision of the Constitution and the election of President are its only functions.

Qualifications. — Must be a citizen, not a member of any family which has occupied the throne of France.

GOVERNMENTS OF THE UNITED STATES, BRITISH EMPIRE,

UNITED STATES

Salary.—Fixed by law at $75,000 per year.

Powers and Duties of the President.—Commander-in-Chief of the Army and Navy. Communicates with Congress by message. Approves or disapproves Acts of Congress. Makes treaties with advice and consent of the Senate. Appoints Public Officers with the advice and consent of the Senate. Commissions Public Officers of the United States. Grants reprieves and pardons for offenses against the United States.

The Vice-President.—Elected by State Electors the same as the President; or by the Senate, in case there is no choice by the State Electors. Term of office same as for the President. Eligibility same as required of the President. Salary fixed by law (1925) at fifteen thousand dollars per year.

The Presidential Succession.—In case of the removal, death, resignation, or inability of the President, the Vice-President takes the President's place.

In case of the removal, death, resignation, or inability of both President and Vice-President the heads of the Executive Departments succeed to the Presidency in the order in which the Executive Departments are named below; but such officer must be constitutionally eligible to the Presidency, must have been appointed to the cabinet by the advice and with the consent of the Senate, and be not under impeachment. The Secretary of Agriculture and the Secretary of Commerce and Labor are ineligible to the presidency by reason of the fact that these two cabinet offices were created subsequent to the passage of the act of the forty-ninth Congress in which provision was made for the presidential succession.

The Executive Departments

Acts of Congress become laws:—When signed (approved) by the President; or, by his failure to make objection in writing (veto) within ten days after any act is submitted to him, unless Congress by adjournment within that time prevents its return; but Congress has power to pass a law over the President's veto by a vote of two-thirds of each House.

The Cabinet

Composed of the heads of the executive departments.

Appointed by the President with the advice and consent of the Senate.

BRITISH EMPIRE

Salary or Civil List.—The Civil List Act, 1910, gave the King $2,350,000. Provision for other members of the Royal Family, $730,000. The Prince of Wales, as the income of the Duchy of Cornwall, $435,000. The King in addition to his Civil List receives the revenues of the Duchy of Lancaster amounting to $320,000.

Powers and Duties.—Has command of the army and navy.

Parliament cannot be assembled, prorogued, or dissolved except by the express command of the Sovereign.

At the commencement of a new Parliament must deliver, either in person or by a commission authorized for that purpose, a speech declaring the cause of the summons.

Bills passed by Parliament must receive the assent of the Sovereign in order to become law.

Has legally a veto power; but, because the influence of the Executive over legislation has passed into the hands of the Ministers, the veto of the Crown has been disused since 1707.

Has power to appoint all officers in the army and navy, judges, ambassadors, colonial governors, bishops and archbishops of the Established Church, and grants all degrees of nobility.

May make treaties of any kind.

May grant pardon to any particular offender.

The Privy Council.—The King in Council is the supreme executive authority in the realm. The Privy Council meets as a whole at the beginning of a new reign and on other occasions of state and ceremony, possesses certain administrative powers, and is the Supreme Court of the Empire. Its personnel includes the royal princes and the archbishops, Members of the Cabinet and of the royal household, the Speaker of the House of Commons, the ambassadors, the principal colonial governors, colonial statesmen, certain judges, and members of both political parties who have never been in office.

The important functions of the Council are the bringing into operation by means of orders in council of the provisions of many statutes which Parliament leaves to the executive to enforce, temporarily or permanently, at such time or times as it may deem necessary and desirable. These orders have all the force and validity of law.

The Executive Departments

The Ministry

The Cabinet, or Inner Council, under the presidency of the Prime Minister, consists of Ministers, drawn from the ranks of the party in power and appointed by the Sovereign on the advice of the Prime Minister.

Members (As reconstituted in June, 1915) and their salaries.

Prime Minister and First Lord of the Treasury.....$25,000
Lord High Chancellor (and $20,000 as Speaker of the House of Lords)..... 50,000
Minister without Portfolio..... unpaid

GERMANY, AND FRANCE ARRANGED IN PARALLEL COLUMNS—Cont'd

GERMANY

Salary. — $80,000.

Responsibility. — Not subject to prosecution without the sanction of the Reichstag.

Powers and Duties. — Represents the nation in matters of international law and accredits and receives Ambassadors.

Concludes alliances and other treaties with foreign powers, with the approval of the Reichstag.

Appoints and dismisses Government officials and military officers directly and indirectly.

Has supreme command of all military forces of the nation.

May compel any constituent state to fulfill its duties to the constitution or Government.

May use armed power to maintain public security and order.

Possesses the right of pardon.

All acts of the President must be countersigned by the Prime Minister or duly qualified Government Ministers.

In case of impediment the President shall be represented by the National Chancellor. Likewise the chancellor succeeds to the duties of the President in case of a premature vacancy.

FRANCE

Salary. —$140,000.

Responsibility. — May be impeached by the Chamber of Deputies, and tried by the Senate, in case of high treason.

Powers and Duties. — Has command of the army and navy.

May convene the Chambers on extraordinary occasions.

May adjourn the Chambers at any time for a period not exceeding one month. Can close a regular session of the Chambers at his discretion after it has continued five months; an extra session when he pleases. Can with the consent of the Senate dissolve the Chamber of Deputies even before the expiration of five months. This puts an end to the session of the Senate also, but not to its life. The President must order a new election in case of dissolution.

At the commencement of a new session of the Chambers the President of the republic sends a message, which is read by one of the Ministers.

Bills passed by the Chambers must be signed by the President, and countersigned by one of his Ministers.

Has no veto power, but is authorized to demand a reconsideration of any measure by the Chambers.

Has power to appoint and remove all officers of the public service, subject to the countersignature of the Minister whose department is affected in each case.

May make treaties of peace, alliance and commerce, but cannot declare war without the advice of the Chambers.

Has power to grant pardons.

Succession. — In case of his death, resignation, or removal, the Council of Ministers act until the National Assembly can meet and elect a new President.

The Executive Departments

The administration of the Government consists of the National Chancellor and the Cabinet Ministers.

Imperial Chancellor. — He has no counterpart in any other constitutional government. He is the President's responsible proxy, controlling the politics of the Republic.

Appointment and Tenure of Office. — Both Chancellor and Ministers must have the confidence of the Reichstag; but are appointed and dismissed by the President.

The Executive Departments

Powers and Duties. — As a Cabinet, the Ministers represent the administration in the Chambers; as a Council, they exercise a general oversight of the administration of the laws, with a view of giving unity of direction to the affairs of the State. The President may be present at all Council meetings.

Cabinet and Council of Ministers. — Both the Cabinet and the Council consist of the same persons. The Cabinet is a political body; the Council, an administrative body.

Appointment. — Chosen by the President, generally from among the members of the Chambers.

GOVERNMENTS OF THE UNITED STATES, BRITISH EMPIRE,

UNITED STATES

Salary.—Secretary of State, $15,000; all other cabinet members (1925), fifteen thousand dollars annually.

HEADS OF DEPARTMENTS

Department of State.—Has charge of foreign affairs.

Treasury Department.—Has charge of fiscal affairs.

Department of War.—Has charge of the Army and military affairs.

Department of Justice.—Has charge of the legal affairs of the Government.

Post-office Department.—Has charge of postal affairs.

Navy Department.—Has charge of the Navy and naval affairs.

Department of the Interior.—Has charge of domestic affairs, including public lands, pensions, patents, Bureau of Education, etc.

Department of Agriculture.—Has charge of agricultural affairs, including Weather Bureau, etc.

Department of Commerce.—Has charge of domestic and foreign affairs, relating to commerce, transportation, etc.

Department of Labor.—Has charge of labor welfare, immigration, naturalization, wages, etc.

Tenure of Office.—Dependent upon the will or favor of the President.

Powers and Duties.—As stated above, but under the direction of the President.

III. Congress.—Consisting of both the Senate and the House of Representatives as co-ordinate bodies.

Duration.—The term of each Congress is for two years, commencing March 4th of the odd years.

Regular Sessions.—Annual, beginning the first Monday in December.

Special Sessions.—At the call of the President.

Membership.—Each House is the judge of the elections and qualifications of its own members.

Congress has General Powers of Legislation.—To provide for the raising and disbursement of revenue. To borrow money; to coin money and to regulate its value; and to fix the standard of weights and measures. To regulate foreign and interstate commerce. To declare war, and to maintain an army and navy. To establish post-offices and post roads. To enact

BRITISH EMPIRE

Lord President of the Council	$10,000
Lord Privy Seal	unpaid
First Lord of the Admiralty	22,500
Secretaries of State:	
Home Affairs	25,000
Foreign Affairs	25,000
Colonies	25,000
War	25,000
India	25,000
Chancellor of the Exchequer	25,000
Minister of Munitions	25,000
Secretary for Scotland	10,000
Chief Secretary to the Lord Lieutenant of Ireland	21,125
Presidents of Committees of the Council:	
Board of Trade	25,000
Local Government Board	25,000
Board of Education	10,000
First Commissioner of Works	10,000
Attorney-General	35,000
Board of Agriculture	10,000

Relations to Parliament.—The Chief of the Cabinet and of the Ministry is called the Prime Minister or Premier. He is the leader of the House of Parliament of which he is a member. He dispenses the greater portion of the patronage of the Crown. Other members of the Cabinet are the leaders of Parliament, shaping and directing the business of the Houses.

Tenure of Office.—Dependent upon the favor of the House of Commons; for if not sustained, they must all resign. When a Ministry resigns it is the function of the sovereign to call upon some statesman to form another administration. There is no restriction upon the Royal choice, but the statesman usually selected is the leader of the opposing party in one of the two Houses.

Powers and Duties.—All real authority is with the Cabinet. The executive government is nominally in the Crown, but practically in the Cabinet. The Ministers are at the heads of the administrative departments. The Sovereign does not sit with the Cabinet.

Other Ministers.—The Ministry includes a number of minor posts whose occupants have no seat in the Cabinet.

III. Parliament.—Parliament consists of two Houses, the House of Lords and the House of Commons. The Sovereign alone has the power of summoning or proroguing or dissolving Parliament, and gives the Royal Assent to measures which have passed both Houses. Unless it be dissolved by the Crown, Parliament exists five years from the date on which it was first to meet. The demise of the Crown does not dissolve Parliament, but, on the contrary, renders an immediate assembling of the two Houses necessary; and if there be no Parliament in existence, the old Parliament must reassemble, and may sit again for six months, if it be not within that time dissolved by the new Sovereign.

All British dominions are subject (except as regards taxation) to the legislation of the British Parliament; but no Act of Parliament

GERMANY, AND FRANCE ARRANGED IN PARALLEL COLUMNS—Cont'd

GERMANY

Powers and Duties. — The Chancellor presides in the Government administration, and conducts its affairs with the approval of the President.

The following are the Ministers of Government. The Prime Minister determines the line of policy and assumes responsibility therefor to the Reichstag. Otherwise, they act independently of each other, under the general supervision of the Chancellor.

Chancellor of the Empire.
Secretary for Foreign Affairs.
Imperial Home Office and *Representative of the Chancellor.*
Imperial Admiralty.
Imperial Secretary of Justice.
Imperial Treasury.
Imperial Post-Office.
Secretary for the Colonies.

And, in addition, the following presidents of bureaus:

Railways.
Imperial Exchequer.
Imperial Bank.
Imperial Debt Commission.
Administration of Imperial Railways.
Imperial Court Martial.

The Ministers must lay before the Government administration for discussion and judgment all drafts of law, all matters prescribed by the constitution, or law, and conflicting opinions concerning the functions of several Government ministers.

FRANCE

Members of the Cabinet. — Membership may vary somewhat:

Premier and Foreign Minister.
Ministers of State.
Minister of Justice and Vice-President of the Council.
Minister of War.
Minister of Marine.
Minister of the Interior.
Minister of Finance.
Minister of Agriculture.
Minister of Public Works.
Minister of Commerce.
Minister of Colonies.
Minister of Instruction and Minister of Inventions affecting National Defense.

Council of State. — Gives advice on all projects of law which the Chambers or the Government wish to submit to it, and on administrative regulations and by-laws. Its decision is final in all disputes arising in matters of administration.

Is presided over by the Minister of Justice, and is composed of Councillors, Masters of Requests, and Auditors, all appointed by the President of the republic.

Relations to the Chambers. — Are the leaders of the Chambers.

Whether members of the Chambers or not, they have as Ministers the right to attend all sessions of the Chambers and take a specially privileged part in debate.

Tenure of Office. — Dependent upon the favor of the Chambers; for, if not sustained, they must all resign.

III. The National Assembly.

The legislative functions of the Republic are vested in the National Council, which represents the several states ,and by the Reichstag or Diet which represents the German nation. The President has no veto on laws passed by these bodies. All laws for the nation must receive the votes of an absolute majority. The National Council and Reichstag must be summoned to meet every year.

Projects of legislation must be introduced by the Government or the Reichstag. The laws of the nation must be determined by the Reichstag.

III. The Chambers. — Consist of the Senate and House of Deputies.

GOVERNMENTS OF THE UNITED STATES, BRITISH EMPIRE,

UNITED STATES

patent and copyright laws. To enact uniform naturalization and bankruptcy laws. To provide for the punishment of crimes against the United States. To establish courts inferior to the Supreme Court. To provide for organizing and calling out the militia. To admit new States into the Union. To provide for the government of the Territories. To exercise exclusive jurisdiction over the District of Columbia, public lands, public buildings, forts, and navy yards. To enact all laws necessary and proper for carrying into execution all the powers vested by the Constitution in the government of the United States.

THE SENATE.—Composed of two Senators from each State (ninety-six in 1917), chosen by popular vote for six years, one-third retiring every two years.

Qualifications.—Must be at least thirty years of age, must have been a citizen of the United States for nine years, and must be an inhabitant of the State which he represents.

Remuneration.—Members receive (1925) ten thousand dollars, with mileage.

Organization.—The Vice-President of the United States is the President of the Senate. Is elected by the Electoral College. Votes only in case of a tie.

Quorum.—A majority of members.

Committees.—Members are divided into standing committees, chosen by the Senate itself, which act in the preliminary examination, and shaping of measures to be voted on.

Powers and Duties.—In concurrence with the House of Representatives, it makes the laws. It also has power to confirm or reject all appointments to office by the President of the United States, and all treaties. The members constitute a high court for the trial of impeachments. Elects Vice-President of the United States if regular election fails.

BRITISH EMPIRE

affects a colony unless that colony is specially mentioned. If the legislature of a colony enacts a law which is repugnant to an imperial law affecting the colony, it is to the extent to which it is repugnant absolutely void.

THE HOUSE OF LORDS.—The House at present consists of three Princes of the Blood, two Archbishops, twenty-one Dukes, twenty-six Marquesses, one hundred and twenty-one Earls, forty-six Viscounts, twenty-four Bishops, three hundred and fifty-six Barons, sixteen Scottish Representative Peers elected for each Parliament, and twenty-seven Irish Representative Peers elected for life. The members hold their seats by virtue of hereditary title; by creation of the Sovereign; by virtue of office (English bishops); by election for life (Irish peers); by election for duration of Parliament (Scottish peers).

Qualifications.—Must be at least twenty-one years of age.

Remuneration.—Receive no pay.

Organization—Quorum.—Three, including the Lord Chancellor; thirty for final vote on a bill. The Lord Chancellor, who is a member of the Cabinet, presides. He is appointed by mere delivery of the Great Seal to him by the Sovereign and is principal legal adviser of the Crown. His patronage is very extensive. He nominates the puisne judges and county court judges; the holder of the office may not be a Roman Catholic.

Committees.—Special committees are appointed to make investigations, and report on matters which could not be undertaken by the whole House.

Powers and Duties.—In concurrence with the House of Commons, makes the laws, having a revising power over all bills proposed by the House of Commons, except those relating to public revenue and expenditure, which it must pass or reject without amendment.

It is the highest appellate court of the United Kingdom. It may in certain cases try members of its own body; it tries any person who may be impeached by the House of Commons, and it also decides claims to the peerage.

GERMANY, AND FRANCE ARRANGED IN PARALLEL COLUMNS—Cont'd

GERMANY	FRANCE
REICHSRAT, or National Council, represents the German states in national legislation and administration. In the Council every state has at least one vote — the larger states having one vote for each million inhabitants.	*THE SENATE* is composed of three hundred members chosen by the Departments and Colonies for nine years, one-third of the members retiring every three years. Until 1884 the Senate contained seventy-five life members, the life list having been originally made up by election by the National Assembly of 1875, and vacancies being filled by the Senate itself. In 1884 this arrangement was abolished, and since that year vacancies in the life roll have been filled by ordinary nine-year Senators.
	Qualifications. — Must be a Frenchman, and at least forty years of age.
Remuneration. — Receive no pay.	*Remuneration.* — 15,000 francs ($3,000).
Organization. — The president of the Council and of its committees must be a member of the Government Administration, and may participate in their activities. A majority vote is decisive.	*Organization — Quorum.* — A majority of members. Elects its own President and Vice-Presidents.
Committees. — No state has more than one voice in committees of the Council.	*Committees.* — Each month the members are divided by lots into "Bureaux." These select all the special committees to which bills are referred, except when the House chooses itself to elect a committee.
Powers and Duties. — May advise with the Government respecting, and cooperate with the Government in preparing bills to be sent to the Reichstag. Its consent is indispensable to the validity of all legislation. Acting with the Government, it is the supreme administrative board.	*Powers and Duties.* — In concurrence with the Chamber of Deputies, makes the laws, and has in law-making the same prerogatives as the Chamber, except that bills relating to revenue originate with the Chamber. It is a court of justice for trying the President of the republic and the Ministers. It may originate, and, in concurrence with the Senate, pass resolutions and bills; but bills relating to finance must be originated by the Chamber of Deputies. Has power to bring accusations against the President of the republic and the Ministers.

GOVERNMENTS OF THE UNITED STATES, BRITISH EMPIRE,

UNITED STATES

HOUSE OF REPRESENTATIVES.—Composed (in 1917) of four hundred and thirty-five members elected every second year for two years by the people of the States in the proportion of one Representative for every 211,877 inhabitants. Each State, however, is entitled to at least one member, whatever its population.

Qualifications.—Must be at least twenty-five years of age, must have been seven years a citizen of the United States, and must be an inhabitant of the State from which he is chosen.

Organization—Quorum. A majority of members. Elects its own presiding officer, who is called the Speaker, salary fifteen thousand dollars per year.

Remuneration.—Members receive (1925) ten thousand dollars and mileage.

Powers of the House of Representatives.—Elects its Speaker (presiding officer) and its other officers. Elects President of the United States if the regular election fails. Prosecutes impeachments before the Senate. Originates all bills for raising revenue.

Committees.—Almost all the acts of the House are under the control of Standing Committees, appointed by the Speaker.

IV. The Judicial Department.

JUDGES OF THE UNITED STATES COURTS

Appointed by the President with the advice and consent of the Senate.

Tenure of Office.—During life or good behavior; but may retire on full salary after reaching the age of seventy years, and after ten years' service on the bench.

THE SUPREME COURT OF THE UNITED STATES

Members.—A Chief Justice and Eight Associate Justices.

Salaries.—Chief Justice, fifteen thousand dollars; Associate Justices, each fourteen thousand five hundred dollars.

Terms of Court.—One each year, beginning on the second Monday in October.

Original Jurisdiction.—In all cases affecting Ambassadors, Ministers, and Consuls. In all cases in which a State is a party.

Appellate Jurisdiction.—In cases of law and equity where the Inferior Courts have original jurisdiction, with such exceptions and regulations as Congress has made.

The Chief Justice.—Presides over the Senate when it sits as a Court of Impeachment for the trial of the President.

BRITISH EMPIRE

HOUSE OF COMMONS.—This body consists of six hundred and seventy elected members representing county, borough, and university constituencies. Roughly speaking, about one-sixth of the population are electors.

Qualifications.—Must be at least twenty-one years of age. Clergymen are disqualified from sitting as members, also English and Scottish peers, government contractors, and sheriffs and returning officers for the localities for which they act.

Organization—Quorum.—Forty members, including the Speaker. Elects its own presiding officer, who is called the Speaker, who has a residence in the Palace of Westminster, and receives a salary of $25,000 per annum.

Remuneration.—$2,000 per year (since 1911).

Powers and Duties.—May originate and, in concurrence with the House of Lords, pass resolutions and bills; but bills relating to the imposition of taxes and the granting of supplies for the service of the State must be originated in the House of Commons.

Committees.—The business of the House is almost entirely under the direction of the Ministry; however, commissions and select committees are from time to time appointed to make investigations and report on matters which could not be undertaken by the House.

IV. Judicial Departments, or Courts of Law.

Privy Council.—The Judicial Committee of the Privy Council (which hears appeals from Colonial and Indian Courts, and also from Ecclesiastical Courts) consists of the Lord Chancellor, Lord President, ex-Lords President, the Lords of Appeal in Ordinary, and such other members of the Privy Council as shall from time to time hold or have held "high judicial office." No dissenting judgments are allowed, but the Judicial Committee can grant special leave to appeal.

The English courts of law having jurisdiction in actions between parties are:

HOUSE OF LORDS

Lord High Chancellor and such peers of Parliament as are holding or have held high judicial office. This is the ultimate Court of Appeal from all the courts in the United Kingdom.

GERMANY, AND FRANCE ARRANGED IN PARALLEL COLUMNS—Cont'd

GERMANY

REICHSTAG, or National Diet, consists of the deputies of the German people, are bound only to their own conscience, and not by any orders. They are chosen on the basis of equal, direct and secret vote by all men and women over the age of twenty.

They are elected for four years.

Organization — Quorum. — A majority of members. Elects its own presiding officer, who is called the President.

Remuneration. — 3,000 marks ($750) per session, with deduction of twenty marks ($5.00) for each day's absence; they have free passes over German railways during session.

Powers and Duties. — Has power to originate and the exclusive right to determine the laws of the nation. It also exerts a controlling influence through its power to give or withhold its sanction to certain ordinances to whose validity the Constitution makes its concurrence necessary, through its right to inquire into the conduct of affairs; and in many other ways not susceptible of enumeration.

Committees. — The Reichstag and its committees may demand the presence of the National Chancellor and of any other Government minister.

IV. Judicial Department.

The laws of the Republic take precedence of the Federated States within the scope of the Constitution of the Republic; they are compulsory on all Governments of the Republic.

A uniform system of law courts exists throughout the Republic, though, with the exception of the Reichsgericht, all courts are directly subject to the Government of the special State in which they exercise jurisdiction, and not to the National Government. The appointment of the judges is also a State and not a National function. The Republic enjoys uniform codes of commercial and criminal law.

National Supreme Court.

Reichsgericht (National Supreme Court), to which there is a right of appeal from all inferior courts, sits at Leipzig, and consists of one hundred judges, appointed by the President.

FRANCE

THE CHAMBER OF DEPUTIES is composed (in 1917) of five hundred and eighty-four Deputies, distributed among the Departments and certain colonies in the proportion of one Deputy to seventy thousand inhabitants. The Deputies are chosen for a term of four years by universal suffrage, the Arrondissements serving as electoral districts.

Qualifications. — Must be a citizen of France and at least twenty-five years of age.

Organization — Quorum. — A majority of members. Chooses its own President, Vice-President and other officers.

Remuneration. — 15,000 francs ($3,000).

Powers and Duties. — May originate, and, in concurrence with the Senate, pass resolutions and bills; but bills relating to finance must be originated by the Chamber of Deputies. Has power to bring accusations against the President of the republic and Ministers.

Committees. — Each month the members are divided by lot into eleven "Bureaux," which select all the special committees to which bills are referred, except when the Chamber chooses to appoint a committee directly.

IV. Judicial Department.

The judicial system is under direct control of the government. All Judges are nominated by the President of the republic. They can be removed only by a decision of the Court of Cassation constituted as the *Conseil Supérieur* of the magistracy.

The Court of Cassation.

The Court of Cassation, which sits at Paris, is the highest court for all criminal cases tried by jury, so far as regards matters of law.

Courts of Appeal. — The highest courts are the twenty-six Courts of Appeal, composed each of one president and a variable number of members, for all criminal cases which have been tried without a jury.

GOVERNMENTS OF THE UNITED STATES, BRITISH EMPIRE,

UNITED STATES

INFERIOR COURTS

Jurisdiction.—In cases between citizens of different States. In cases in which the United States is a party. In cases of admiralty and maritime jurisdiction. In trials for crimes against the United States; but the trial of crimes must be by jury, and must be held in the State where the crime was committed.

Appeals to the Supreme Court may be had in all cases of law and equity, with such exceptions and regulations as Congress has made.

KINDS OF INFERIOR COURTS

United States Circuit Courts of Appeals.—Organized in 1891 to relieve the United States Supreme Court in Appellate Cases. Number: One in each Judicial Circuit. Members: Three judges selected from the District Courts.

Number.—One in each Judicial Circuit.

Members.—Three judges selected from the District Courts.

United States Circuit Courts.—

Number of Circuits.—Nine.

Number of Judges.—Each Circuit has two, three, or four Circuit Judges, and a Justice of the Supreme Court is assigned to each Circuit. The District Judge also may sit in a Circuit Court.

Salary of Circuit Judges.—Fixed by law at seven thousand dollars per year.

United States District Courts.—

Number of Districts.—One of more in each State. At present there are seventy-three Judicial Districts.

Salary of District Judge.—Fixed by law at seven thousand dollars per year.

United States Court of Claims.—

Jurisdiction.—Claims against the United States, including all claims which may be referred to it by Congress.

Members.—One Chief Justice and four Associate Justices.

Salaries.—Chief Justice, six thousand five hundred dollars; Associate Justices, each six thousand dollars.

In addition to the above named courts, Congress has established courts of local jurisdiction in the District of Columbia and in the Territories.

BRITISH EMPIRE

There are two Courts of Appeal below these divisions:

Lords of Appeal in Ordinary.—Consisting of six Justices.

Court of Appeal.—Ex-Officio Judges, the Lord High Chancellor, the Lord Chief Justice of England, the Master of the Rolls, and the President of the Probate, Divorce and Admiralty Division.

The High Court comprises the King's Bench, Chancery, and Probate, Divorce and Admiralty Divisions.

High Court of Justice, Chancery Division.—(Administration of trusts, company cases, mortgages, patents, etc.). Consists of the Lord High Chancellor and six other Justices.

High Court of Justice, King's Bench Division.—(Contracts, torts, bankruptcy, etc.). Consists of the Lord Chief Justice of England and fifteen other Justices.

High Court of Justice, Probate, Divorce and Admiralty Division.—(Wills, matrimonial cases, and maritime cases). Consists of two Justices.

Court of Criminal Appeal.—All the Judges of King's Bench Division.

Court of Arches.—An ecclesiastical court unites the powers of the *jus canonicum* with new powers conceded by the Church Discipline Act, 1841, and the similar statute of 1874, exercising authority in both provinces. The Judicial Committee of Privy Council is the Court of Final Appeal in ecclesiastical causes.

Bankruptcy Court.—Consisting of one Justice.

IMPORTANT BIOGRAPHICAL FACTS RELATING

TABLE I. BIRTH AND PARENTAGE

NAMES OF PRESIDENTS	BORN		PARENTS	
	Date	Birthplace	Father	Mother
1. **George Washington**	Fri., Feb. 22, 1732	Bridges Creek, near Fredericksburg, Va.	Augustine	Mary Ball
2. **John Adams**	Wed., Oct. 30, 1735	Quincy, Mass.	John	Susanna Boylston
3. **Thomas Jefferson**	Tues., April 13, 1743	Shadwell, Va.	Peter	Jane Randolph
4. **James Madison**	Fri., Mar. 16, 1751	Port Conway, Va.	James	Nellie Conway
5. **James Monroe**	Fri., April 28, 1758	Westmoreland Co., Va.	Spence	Eliza Jones
6. **John Quincy Adams**	Sat., July 11, 1767	Quincy, Mass.	John	Abigail Smith
7. **Andrew Jackson**	Sun., Mar. 15, 1767	Union County, N. C.	Andrew	Elizabeth Hutchinson
8. **Martin Van Buren**	Thurs., Dec. 5, 1782	Kinderhook, N. Y.	Abraham	Maria Hoes
9. **William Henry Harrison**	Tues., Feb. 9, 1773	Berkeley, Va.	Benjamin	Elizabeth Bassett
10. **John Tyler**	Mon., Mar. 29, 1790	Charles City Co., Va.	John	Mary Armistead
11. **James Knox Polk**	Mon., Nov. 2, 1795	Mecklenburg Co., N. C.	Samuel	Jane Knox
12. **Zachary Taylor**	Tues., Nov. 24, 1784	Orange Co., Va.	Richard	Sarah Strother
13. **Millard Fillmore**	Tues., Jan. 7, 1800	Summerhill, N. Y.	Nathaniel	Phebe Millard
14. **Franklin Pierce**	Fri., Nov. 23, 1804	Hillsborough, N. H.	Benjamin	Anna Kendrick
15. **James Buchanan**	Sat., April 23, 1791	Cove Gap, Pa.	James	Elizabeth Speer
16. **Abraham Lincoln**	Sun., Feb. 12, 1809	Nolin Creek, Ky.	Thomas	Nancy Hanks
17. **Andrew Johnson**	Thurs., Dec. 29, 1808	Raleigh, N. C.	Jacob	Mary McDonough
18. **Ulysses Simpson Grant**	Sat., April 27, 1822	Point Pleasant, Ohio	Jesse Root	Harriet Simpson
19. **Rutherford Birchard Hayes**	Fri., Oct. 4, 1822	Delaware, Ohio	Rutherford	Sophia Birchard
20. **James Abram Garfield**	Sat., Nov. 19, 1831	Orange Township, Ohio	Abram	Eliza Ballou
21. **Chester Alan Arthur**	Tues., Oct. 5, 1830	Fairfield, Vt.	William	Malvina Stone
22. **Grover Cleveland**	Sat., Mar. 18, 1837	Caldwell, N. J.	Richard Falley	Anne Neale
23. **Benjamin Harrison**	Tues., Aug. 20, 1833	North Bend, Ohio	John Scott	Elizabeth Findlay Irwin
24. **Grover Cleveland**	Sat., Mar. 18, 1837	Caldwell, N. J.	Richard Falley	Anne Neale
25. **William McKinley**	Sun., Jan. 29, 1843	Niles, Ohio	William	Nancy C. Allison
26. **Theodore Roosevelt**	Wed., Oct. 27, 1858	28 East 20th St., New York City	Theodore	Martha Bullock
27. **William Howard Taft**	Tues., Sept. 15, 1857	Cincinnati, Ohio	Alphonso	Louise M. Torrey
28. **Woodrow Wilson**	Sun., Dec. 28, 1856	Staunton, Va.	Jos. Ruggles	Jessie Woodrow
29. **Warren G. Harding**	Nov. 2, 1865	Morrow Co., Ohio	Geo. T. Harding	Phoebe Dickerson
30. **Calvin Coolidge**	July 4, 1872	Plymouth, Vt.	John C.	Victoria Moor

GERMANY, AND FRANCE ARRANGED IN PARALLEL COLUMNS—Continued

GERMANY

The Oberlandesgerichte (Supreme Court), which are the first courts of the second instance, have original jurisdiction in serious offenses, and are presided over by seven judges.

The Landgericht (County Courts) have a fairly extensive jurisdiction in civil and criminal cases and in divorce proceedings. There are five judges in the criminal chamber of a Landgericht, four votes being required to make a conviction valid. Three judges from such a court preside at intervals over jury courts (Schwurgerichte), and juries do not, therefore, form a permanent part of the system.

Not the least important work of the Landgerichte is to revise the decisions of the Amtsgerichte, which are the lowest courts of the first instance, being controlled by single judges, who are competent to hear only petty civil and criminal cases.

The Amtsgerichte (Police or District Courts) are the lowest courts, each with a single judge competent to try petty civil and criminal cases, divorce cases, etc.

FRANCE

Court of Assizes.—In all cases of a *délit* or a crime the preliminary inquiry is made in secrecy by an examining magistrate (*juge d'instruction*), who may either dismiss the case or send it for trial before a court where a public prosecutor (procureur) endeavors to prove the charge. The Court of Assizes is assisted by twelve jurors, who decide by simple majority on the fact with respect to offenses amounting to crimes.

Justices of the Peace (*juges de paix*) are the courts of lowest jurisdiction in France. They try small civil cases and act also as judges of Police Courts, where all petty offenses (contraventions) are disposed of. The Correctional Courts pronounce upon all graver offenses (*délits*), including cases involving imprisonment up to five years. They have no jury, and consist of three judges belonging to the civil tribunals of first instance.

For commercial cases there are, in two hundred and twenty-six towns, Tribunals of Commerce and Councils of Experts (prud' hommes). In the towns are police courts.

TO THE PRESIDENTS OF THE UNITED STATES

TABLE II. EDUCATION, PROFESSION, RELIGION AND POLITICS

Paternal Ancestry	Father's Business	Educational Advantages	Early Vocation	Profession	Religious Connection	Politics
English	Planter	Common School	Surveyor	Planter	Episcopalian	Federalist.
English	Farmer	Harvard College, 1755	Teacher	Lawyer	Unitarian	Federalist.
Welsh	Planter	College of William and Mary, 1762	Lawyer	Lawyer	Liberal	Republican*
English	Planter	Princeton College, 1771	Lawyer	Lawyer	Episcopalian	Republican.
Scotch	Planter	Entered College, William and Mary	Lawyer	Politician	Episcopalian	Republican.
English	Lawyer	Harvard College, 1787	Lawyer	Lawyer	Unitarian	Republican.
Scotch-Irish	Farmer	Self Taught	Lawyer	Lawyer	Presbyterian	Democrat.
Dutch	Farmer	Academy	Lawyer	Lawyer	Reformed Dutch	Democrat.
English	Statesman	Entered Hampden-Sidney College	Medicine	Army	Episcopalian	Whig.
English	Jurist	College, William and Mary, 1806	Lawyer	Lawyer	Episcopalian	Democrat.
.....	Farmer	University of North Carolina	Lawyer	Lawyer	Presbyterian	Democrat.
Scotch-Irish	.....	Common School	Soldier	Army	Episcopalian	Whig.
English	Farmer	Public School	Tailor	Lawyer	Unitarian	Whig.
English	Farmer	Bowdoin College, 1824	Lawyer	Lawyer	Episcopalian	Democrat.
Scotch-Irish	Merchant	Dickinson College, 1809	Lawyer	Lawyer	Presbyterian	Democrat.
English	Farmer	Self Taught	Farmer	Lawyer	Liberal	Republican.
English	Sexton	Self Taught	Tailor	Politician	Liberal	Republican.
Scotch	Farmer	West Point Military Academy, 1843	Tanner	Army	Methodist	Republican.
Scotch	Merchant	Kenyon College, Ohio, 1842	Lawyer	Lawyer	Methodist	Republican.
English	Farmer	Williams College, 1856	Teacher	Lawyer	Disciples	Republican.
Scotch-Irish	Clergyman	Union College, 1843	Teacher	Lawyer	Episcopalian	Republican.
English	Clergyman	Common School	Teacher	Lawyer	Presbyterian	Democrat.
English	Farmer	Miami University, Ohio, 1851	Lawyer	Lawyer	Presbyterian	Republican.
English	Clergyman	Common School	Teacher	Lawyer	Presbyterian	Democrat.
Scotch-Irish	Iron Mnfr.	Entered Allegheny College	Lawyer	Lawyer	Methodist	Republican.
Dutch	Merchant	Harvard, 1880	Publicist	Publicist	Reformed Dutch	Republican.
English	Lawyer	Yale, 1878	Lawyer	Lawyer	Unitarian	Republican.
Scotch-Irish	Clergyman	Princeton, 1879	Lawyer	Educator	Presbyterian	Democrat.
Scotch-Dut.	Physician	Ohio Central College, 1884	Editor	Publisher	Baptist	Republican.
English	Farmer	Amherst, 1895	Lawyer	Lawyer	Congregational	Republican.

* The *first* Republican party, founded by Jefferson, later developed into the Democratic party of today.

IMPORTANT BIOGRAPHICAL FACTS RELATING T

TABLE III. MARRIAGE, CHILDREN AND ELECTION TO THE PRESIDENCY

Terms	Name	Married	Wife's Name	Children		Elected President	Residence When Elected	Age When Inaugurated
				Boys	Girls			
1-2	**Washington**	1759	Martha (Dandridge) Custis (1732-1802), widow with two children	0	0	1789	Mt. Vernon, Va.	57
3	**Adams**	1764	Abigail Smith (1744-1818)	3	2	1796	Quincy, Mass.	62
4-5	**Jefferson**	1772	Martha (Wayles) Skelton (1748-1782), widow of Bathurst Skelton	0	6	1800	Monticello, Va.	5[illegible]
6-7	**Madison**	1794	Dolly (Payne) Todd (1772-1849), widow.	0	0	1808	Montpelier, Va.	58
8-9	**Monroe**	1786	Eliza Kortwright (1768-1830)	0	2	1816	Oakhill, Va.	59
10	**Adams, J.Q.**	1797	Louisa Catherine Johnson (1775-1852)	3	1	1824	Quincy, Mass.	58
11-12	**Jackson**	1791	Rachel (Donelson) Robards (1767-1828), divorced wife of Captain Robards	3	0	1828	Hermitage, Tenn.	62
13	**Van Buren**	1807	Hannah Hoes (1783-1819)	4	0	1836	Kinderhook, N. Y.	55
14	**Harrison**	1795	Anna Symmes (1775-1864)	6	4	1840	North Bend, Ohio	68
14	**Tyler**	1813	(1) To Letitia Christian (1790-1842)	3	4	....	Williamsburg, Va.	51
		1844	(2) To Julia Gardiner (1820-1889)	4	2			
15	**Polk**	1824	Sarah Childress (1803-1891)	0	0	1844	Nashville, Tenn.	50
16	**Taylor**	1810	Margaret Smith (1788-1852)	1	3	1848	Baton Rouge, La.	65
16	**Fillmore**	1826	(1) Abigail Powers (1798-1853)	1	1	.....	Buffalo, N. Y.	50
		1858	(2) Caroline (Carmichael) McIntosh (1813-1881), a widow	0	0			
17	**Pierce**	1834	Jane Means Appleton (1806-1863)	3	0	1852	Concord, N. H.	49
18	**Buchanan**	....	Unmarried	...	...	1856	Wheatland, Pa.	66
19-20	**Lincoln**	1842	Mary Todd (1818-1882)	4	0	1860	Springfield, Ill.	52
20	**Johnson**	1827	Eliza McCardle (1810-1876)	3	2	....	Greeneville, Tenn.	57
21-22	**Grant**	1848	Julia Dent (1826-1902)	3	1	1868	Washington, D. C.	47
23	**Hayes**	1852	Lucy Ware Webb (1831-1889)	7	1	1876	Fremont, Ohio	54
24	**Garfield**	1858	Lucretia Rudolph (1832——)	4	1	1880	Mentor, Ohio	49
24	**Arthur**	1859	Ellen Lewis Herndon (1837-1880)	1	1	....	New York City	51
25	**Cleveland**	1886	Frances Folsom (1864——)	2	3	1884	Buffalo, N. Y.	48
26	**Harrison**	1853	(1) Caroline Scott (1832-1892)	1	1	1888	Indianapolis, Ind.	55
		1896	(2) Mary Scott (Lord) Dimmick 1858-)	0	1			
27	**Cleveland**	....	Frances Folsom (1864——)	...	...	1892	Buffalo, N. Y.	56
28-29	**McKinley**	1871	Ida Saxton (1844-1907)	0	2	1896	Canton, Ohio	54
29-30	**Roosevelt**	1880	(1) Alice Lee (1861-1884)	0	1	1904	Oyster Bay, N. Y.	43
		1886	(2) Edith Kermit Carow (1861——)	4	1			
31	**Taft**	1886	Helen Herron (1861——)	2	1	1908	Cincinnati, Ohio	51
32-33	**Wilson**	1885	(1) Helen Louise Axsen (1860-1914)	0	3	1912	Princeton, N. J.	56
		1915	(2) Edith Bolling Galt (1872——)	...	...			
34	**Harding**	1891	Florence Kling	...	...	1920	Marion, Ohio	55
35	**Coolidge**	1905	Grace Goodhue	2	...	....	Northampton, Mass.	51

TABLE V. LATER CAREER, WRITINGS AND SOBRIQUETS

Name	Career After Leaving the Presidency	Writings of the Presidents	Presidential Sobriquet
Washington	Agricultural pursuits; appointed commander-in-chief (1798) because of threatened war with France.	*Maxims; Transcripts of Revolutionary Correspondence.*	"Father of his Country" "American Fabius."
Adams	Member of the Massachusetts Constitutional Convention of 1820.	*Essay on Canon and Feudal Law; Defense of the American Constitution.*	"Colossus of Independence" "Son of Liberty."
Jefferson	Retired to his plantation at Monticello, Va.; devoted much time to the University of Virginia.	*A Summary View of the Rights of America; The Declaration of Independence; Act for Freedom of Religion.*	"Sage of Monticello," "Lo Tom."
Madison	Retired to Montpelier, Va.; contributed large service to University of Virginia; served in the Virginia Constitutional Convention, 1829.	*Reports of Debates During the Congress, of the Confederation and Federal Congress; Essays.*	"Father of the Constitution
Monroe	Retired to private life in Virginia; served as a member of the Virginia Constitutional Convention in 1830.	*A View of the Conduct of the Executive; The People; The Sovereign.*	"Last Cocked Hat."
Adams, J.Q.	Was returned to Washington as a member of the House of Representatives; served from 1830 to his death.	*Poems of Religion and Society; Lectures on Rhetoric and Oratory; Criticisms of Paine's "Rights of Man;" Defense of Washington's Policy of Neutrality.*	"Old Man Eloquent."
Jackson	Retired to the "Hermitage," near Nashville, Tenn.; always took a deep interest in public affairs.		"Old Hickory;" "Cæsar the White House."
Van Buren	Was renominated in 1840, 1844, and 1848 for the presidency.	*Inquiry Into the Origin and Causes of Political Parties in the United States.*	"Little Magician;" "Wiza of Kinderhook."
Harrison	Died in office.	*A Discourse on the Aborigines of the Valley of the Ohio.*	"Tippecanoe."
Tyler	Retired to his estate in Virginia; presided at the peace convention held in Washington in 1861.		"Young Hickory."
Polk	Died in office.		Also "Young Hickory."
Taylor			"Rough and Ready;" "C Buena Vista."
Fillmore	Was candidate for president in 1852 and in 1856; spent his remaining years at Buffalo, N. Y.		"The American Lou Philippe."
Pierce	Traveled in Europe; retired to Concord, N. H.		"Purse."

THE PRESIDENTS OF THE UNITED STATES—Continued

TABLE IV. TERM OF OFFICE, DEATH AND PLACE OF BURIAL

Term of Office	Died	Cause of Death	Age at Death	Place of Death	Place of Burial
April 30, 1789—Mar. 4, 1797	1799	Pneumonia	67	Mt. Vernon, Va.	Mt. Vernon, Va.
Mar. 4, 1797—Mar. 4, 1801	1826	Natural decline	90	Quincy, Mass.	Unitarian ch., Quincy, Mass.
Mar. 4, 1801—Mar. 4, 1809	1826	Chronic diarrhœa	83	Monticello, Va.	Monticello, Albemarle Co., Va.
Mar. 4, 1809—Mar. 4, 1817	1836	Natural decline	85	Montpelier, Va.	Montpelier, Hanover Co., Va.
Mar. 4, 1817—Mar. 4, 1825	1831	Natural decline	73	New York City	Hollywood, Richmond, Va.
Mar. 4, 1825—Mar. 4, 1829	1848	Paralysis	80	Washington, D. C.	Unitarian, Quincy, Mass.
Mar. 4, 1829—Mar. 4, 1837	1845	Consumption	78	Hermitage, near Nashville, Tenn.	Hermitage, near Nashville, Tenn.
Mar. 4, 1837—Mar. 4, 1841	1862	Asthma	79	Kinderhook, N. Y.	Kinderhook, N. Y.
Mar. 4, 1841—April 4, 1841	1841	Pleurisy fever	68	White House, Washington, D. C.	North Bend, Ohio.
April 6, 1841—Mar. 4, 1845	1862	Bilious attacks with bronchitis	71	Ballard House, Richmond, Va.	Hollywood, Richmond, Va.
Mar. 4, 1845—Mar. 4, 1849	....	Chronic diarrhœa	53	Nashville, Tenn.	Nashville, Tenn.
Mar. 4, 1849—July 10, 1850	1850	Cholera morbus and typhoid fever	65	White House, Washington, D. C.	Springfield, Ky.
July 10, 1850—Mar. 4, 1853	1874	Paralysis	74	Buffalo, N. Y.	Forest Lawn, Buffalo, N. Y.
Mar. 4, 1853—Mar. 4, 1857	1869	Dropsy and inflammation of stomach	64	Concord, N. H.	Concord, N. H.
Mar. 4, 1857—Mar. 4, 1861	1868	Rheumatic gout	77	Lancaster, Pa.	Woodward Hill, Lancaster, Pa.
Mar. 4, 1861—April 15, 1865	1865	Assassinated by Booth	56	Washington, D. C.	Oak Ridge, Springfield, Ill.
April 15, 1865—Mar. 4, 1869	1875	Paralysis	66	Greeneville, Tenn.	Greeneville, Tenn.
Mar. 4, 1869—Mar. 4, 1877	1885	Cancer of the tongue.	63	Mt. McGregor, N. Y.	Riverside, New York City.
Mar. 4, 1877—Mar. 4, 1881	1893	Neuralgia of heart	70	Fremont, Ohio	Fremont, Ohio.
Mar. 4, 1881—Sept. 19, 1881	1881	Assassinated by Guiteau	49	Elberon, Long Branch, N. J.	Lake View Cemetery, Cleveland, Ohio.
Sept. 20, 1881—Mar. 4, 1885	1886	Bright's disease	56	New York, N. Y.	Rural Cemetery, Albany, N. Y.
Mar. 4, 1885—Mar. 4, 1889	....	.....	..	.....	.....
Mar. 4, 1889—Mar. 4, 1893	1901	Pneumonia	67	Indianapolis, Ind.	Crown Hill Cemetery, Indianapolis, Ind.
Mar. 4, 1893—Mar. 4, 1897	1908	Heart failure	71	Princeton, N. J.	Princeton, N. J.
Mar. 4, 1897—Sept. 14, 1901	1901	Assassinated by Czolgosz	58	Buffalo, N. Y.	Cemetery, Canton, Ohio.
Sept. 14, 1901—Mar. 4, 1909	1919	Pulmonary embolism	..	Oyster Bay, N. Y.	Oyster Bay, Long Island, .Y.
Mar. 4, 1909—Mar. 4, 1913	....	.....	..	.....	.....
Mar. 4, 1913—Mar. 4, 1921	1924	Apoplexy	67	Washington, D. C.	Washington, D.C.
Mar. 4, 1921—Aug. 2, 1923	1923	Apoplexy	58	San Francisco, Cal.	Marion, Ohio.
Aug. 3, 1923—	....	.....	..	.....	.....

TABLE V. LATER CAREER, WRITINGS AND SOBRIQUETS—Continued

Name	Career After Leaving the Presidency	Writings of the Presidents	Presidential Sobriquets
Buchanan	Retired to Lancaster, Pa.; devoted himself to writing defense of his administration.	*Résumé of My Administration.*	"Old Public Functionary;" "Bachelor President."
Lincoln	Died in office.	*Orations.*	"Honest Old Abe;" "Rail-splitter;" "Great Emancipator."
Johnson	Retired to home in Greeneville, Tenn.; chosen United States Senator in 1875.	*Speeches.*	"Sir Veto."
Grant	Made tour of the world and retired to private life in New York.	*Shiloh; Vicksburg; Chattanooga; The Wilderness; The Personal Memoirs of U. S. Grant.*	"Unconditional Surrender;" "Old Three Stars."
Hayes	Was president of the Board of Freedmen, and president of the National Prison association.		"President de Facto."
Garfield	Died in office.	*Discovery and Ownership of the Northwestern Territory; Garfield's Words.*	"The Martyr President;" "The Dark Horse."
Arthur	Died the year following his retirement.		"Our Chet;" "America's First Gentleman."
Cleveland	Retired to New York to practice law; at the end of second term, retired to Princeton, N. J.	*Writings and Speeches.*	"Man of Destiny;" "The Claimant."
Harrison	Professor of International law at Leland Stanford University, California; afterward practiced law.	*Speeches; This Country of Ours; Views of an Ex-President.*	"Son of His Grandfather;" "Hoosier President."
McKinley	Died in office.	*Speeches.*	"Prosperity's Advance Agent;" "Bonaparte of Politics."
Roosevelt	In March, 1909, headed a scientific expedition to Africa, organized in the interest of the Smithsonian Institution; resumed literary work and politics.	*The Naval War of 1812; Essays on Practical Politics; The Winning of the West; Hero Tales From American History; American Ideals; Life of Oliver Cromwell; African Game Trails.*	"Teddy;" "The Rough Rider;" "T. R.;" "Our Strenuous President."
Taft	Kent Professor of Law at Yale University; Chief Justice, U. S.		"The Globe Trotter;" "The Judicial President."
Wilson	.....	*Congressional Government; The State; An Old Master, and Other Political Essays; Mere Literature and Other Essays; George Washington; A History of the American People.*	"The Scholar in Politics."

CANADA.—What is known as the Dominion of Canada is a confederation of the colonies of British North America, constituted in 1867 by the British North America Act of that year. Upper and Lower Canada, Nova Scotia, and New Brunswick were the first to unite under the provisions of that statute, and the Dominion of Canada now includes the whole of the British North American possessions excepting Newfoundland.

Canada is nearly as large as the whole of Europe, and about 750,000 square miles larger than the United States without Alaska. The census figures for 1911 were:

	Area sq. mi.	Population
Prince Edward Island	2,184	93,728
Nova Scotia	21,428	492,338
New Brunswick	27,985	351,889
Quebec	351,873	2,002,712
Ontario	260,862	2,523,274
Manitoba	73,732	455,614
British Columbia	355,855	392,480
Alberta	255,285	374,663
Saskatchewan	251,700	492,432
Yukon (Territory)	207,076	8,512
Northwest Territories	1,921,685	17,196
Total	3,729,665	7,204,838

In 1912 parts of the Northwest Territories were transferred to Manitoba, Ontario, and Quebec.

NEWFOUNDLAND.—The island of Newfoundland, on the northeast side of the Gulf of St. Lawrence, has a total area of 42,750 square miles, with a population (1911) of 238,670. Attached to the government of the island is a coastal strip of the Labrador peninsula 120,000 square miles (population 3,949).

Physical Features.—Both the Atlantic and Pacific shores abound in deep indentations forming magnificent harbors and sheltered bays. On the Atlantic the principal bay is the Bay of Fundy, remarkable for its high and rushing tide, the water rising from twelve to seventy feet. There is also the Hudson Bay, connected with the Atlantic by Hudson Straits, really an inland sea with an area of three hundred and fifty thousand square miles, and the Gulf of St. Lawrence, eighty thousand square miles in extent.

The most striking physical features of Canada are the Rocky Mountains, the Laurentian Range, and the chain of immense fresh water lakes forming part of the boundary with the United States.

The Laurentian Range extends along the north side of the St. Lawrence, the Ottawa River, and then stretches away to Lake Superior and the north, the length of the range being about three thousand five hundred miles. It forms the watershed between Hudson Bay and the St. Lawrence, and varies in height from one to three thousand feet.

The eastern portions of Canada are generally well timbered, and the same is true of British Columbia, and the region north of the Saskatchewan. Westward of the Red River, between the forty-ninth and fifty-fifth parallels, there is an immense fertile plain, suitable for general agriculture and grazing, extending nearly to the Rocky Mountains.

This range consists of triple chains with valleys between; the most easterly has the greatest elevation near the fifty-second parallel, the highest peaks being Mounts Brown, Murchison, Hooker, Columbia, Forbes, Bryce, Alberta, and Freshfield. The average height of the chain is from seven thousand to eight thousand feet. In the north, adjoining Alaska, is Mt. Logan, and, on the dividing line, St. Elias. (See Mountains of the World for elevations.)

Lakes and Rivers.—Canada is well watered, the country presenting a network of lakes and rivers. The system of the St. Lawrence alone, with the great lakes Superior, Huron, Michigan, Erie, and Ontario (between the last are the celebrated falls of Niagara), drains an area in Canada of three hundred and thirty thousand square miles. (See North America and United States.)

Other important lakes are Winnipeg, Winnipegosis, Manitoba, Lake of the Woods, Great Slave, Great Bear, and Athabasca.

Next to the St. Lawrence the chief rivers are the Saskatchewan and the Winnipeg, flowing into Lake Winnipeg, and the Nelson, flowing from it into Hudson Bay; the Assiniboine and the Red River, which join their waters to flow into Lake Winnipeg; the Albany and the Churchill, emptying into Hudson Bay; the Athabasca and the Peace Rivers, flowing into Lake Athabasca, and the Slave River, from it into Great Slave Lake; the Mackenzie, fed from both the Great Slave and the Great Bear lakes, and emptying into the Arctic Ocean; the Fraser and Thompson, in British Columbia, emptying into the Pacific; and in the eastern provinces, the Ottawa, chief tributary of the St. Lawrence, itself fed by the Gatineau and Matawan; the Saguenay, emptying Lake St. John into the St. Lawrence; and the St. John, which flows into the Bay of Fundy, in New Brunswick, which it partly separates from the State of Maine.

The principal islands of the Dominion are: on the east, Cape Breton, Prince Edward and Magdalen Islands, and Anticosti, in the Gulf of St. Lawrence; and on the west coast, Vancouver Island and Queen Charlotte Island. Lying along the north in the great Arctic Archipelago are immense islands, all of which, excepting Greenland, belong to Canada.

Climate.—The cold winter and the heat in summer are frequently extreme, but the climate is a healthy one. The winter may be said to continue from the middle of November to the end of March, or about four and a half months. British Columbia probably possesses the finest climate in North America.

In some inland parts of Canada the maximum temperature may be from ninety to ninety-six degrees, and the minimum from twenty to twenty-six degrees below zero. But although there are these extremes, the air is always dry, bracing, and exhilarating.

Products and Industries.—The chief industries of Canada are those of agriculture, stock-raising, dairy-farming, "lumbering" or timber trade and forestry, shipbuilding, fisheries, and mining. An extensive trade is maintained with the United States and England, the exports being timber, fish, and furs, with

dairy produce and live stock; wheat and wheat flour, barley, and other agricultural products, cod and other fish, coal, and minerals.

The minerals are chiefly coal, silver, nickel, gold, copper, iron, asbestos, lead, salt, mineral oils and gypsum. Gold is or has been worked in Nova Scotia, Quebec, and Ontario, and largely in Yukon (Klondike) and British Columbia, where there are yet immense fields to open up. Silver mines are worked in Ontario; those at Cobalt (producing also cobalt, nickel and arsenic) have been the richest yet discovered in Canada. Iron ore is found all over the Dominion. Copper has been mined to a considerable extent both in Quebec and Ontario, and the deposits of the ore are of great extent. There are very large coal deposits in Nova Scotia. The coast of British Columbia is rich in coal of a good quality. Coal is known to exist over a vast region, stretching from one hundred and fifty to two hundred miles east of the Rocky Mountains, and north from the frontier for about one thousand miles.

The forest products of Canada constitute one of her most important sources of wealth. They find their way to all parts of the world—to the United States, to the United Kingdom, and to the Australian commonwealth.

Great progress has recently been made in the development of manufactures. The "national policy" comprises a high protective system, but since 1901 gives a preference to Britain.

Quebec has tanning industries and manufactures boot and shoes, the manufactures of woolen and cotton goods are increasing, and there are sugar refineries in Halifax and Montreal. Such wooden articles as doors, window sashes, etc., are manufactured in large numbers.

People.—The province of Ontario is thickly settled on the south, along the river and the lake shores, by a population which is mainly of British descent, with a considerable infusion of Germans. The province of Quebec is peopled in great part by descendants of the original French settlers; they are called *habitans;* many of them speak an archaic French dialect and keep up peculiar manners and customs, and they are Roman Catholic in religion.

The principal nationalities represented are English, Irish, Scotch, French, German and Indian, though there are also some few Dutch, Russian, Chinese, Welsh, Italians, Jews, half-breeds, etc.

Though English is the general language of Canada, the French language is by statute an official language in the Dominion parliament and in Quebec, but not now in any other province. Members of the Quebec and Manitoba parliaments may also address the House in either English or French.

Religion and Education.—There is no state religion in Canada, and absolute toleration is there an accomplished fact. Roman Catholics, Methodists, Presbyterians, the Church of England, Baptists, Lutherans, and Congregationalists are all represented.

Canada has long been in the enjoyment of free education, and the control of the system is in the hands of the provinces, except where the Act of Confederation secures the permanence of the denominational schools which existed at the time of confederation. Teachers are trained at provincial normal schools.

In Ontario and Quebec there are separate schools for Protestants and Roman Catholics.

The principal universities of Canada with the dates of their foundation are as follows:

PRINCIPAL UNIVERSITIES AND COLLEGES OF CANADA

Organized	Colleges	Location	Control	President or Chairman of Faculty	Instructors	Students	Volumes in Library
1881	Alma College	St. Thomas, Ont.	Methodist	Robt. I. Warner, D.D.	20	150	2,000
1838	Acadia University	Wolfville, N.S.	Baptist	Geo. Barton Cutten, D.D.	27	231	25,000
1814	Dalhousie	Halifax, N.S	Non-Sect.	A. Stanley MacKenzie, Ph.D.	80	398	28,000
1894	Havergal Ladies College	Toronto, Ont.	Prot. Epis.	N. W. Hoyles, K. C., LL.D.	39	297	2,000
1789	Kings University	Windsor, N.S.	Prot. Epis.	T. S. Boyle, M. A., D.D.	9	55	.....
1844	Knox Theo. College	Toronto, Ont.	Presbyt'n.	Rev. Alfred Gandler, D.D.	9	140	22,000
1907	Macdonald College	A. de Bellevue, Q.	Non-Sect.	F. C. Harrison, D.Sc.	50	407	9,000
1906	McGill Univ. Col.	Vancouver, B.C.	Non-Sect.	Geo. E. Robinson (Act.)	24	340	1,600
1821	McGill University	Montreal, Can.	Indepen.	.....	280	1,620	150,000
1887	McMaster University	Toronto, Ont.	Baptist	A. L. McCrimman, M.A.	30	300	20,000
1873	Montreal Diocesan Theo.	Montreal, Can.	Prot. Epis.	E. I. Rexford, M.A.	5	30	7,000
1863	Mt. Allison University	Sackville, N.B.	Methodist	Byron C. Borden, D.D.	21	250	12,000
1874	Ontario Ladies' Col.	Whitby, Ont.	Methodist	Rev. J. J. Hare, M.A.	22	185	7,000
1867	Presbyterian College	Montreal, Can.	Presbyt'n.	Rev. D. J. Fraser (Principal)	21	80	20,000
1855	Provincial Nor. Col.	Truro, N. S.	State	David Soloam, LL.D.	20	425	4,000
1847	Queen's University	Kingston, Ont.	Non-Sect.	Very Rev. D. M. Gordon	125	1,610	67,000
1888	Ridley College	St. Cath'n's, Ont.	Anglican	Rev. J. O. Miller, M.A.	16	160	.....
1899	St. Andrew's College	Toronto, Ont.	.....	Rev. D. B. Macdonald, M.A.	18	250	.....
1851	Trinity College	Toronto, Ont.	Prot. Epis.	Rev. T. C. S. Macklem	24	180	15,000
1845	Univ. of Bishop's Col.	Lennoxville, Que.	Anglican	Rev. R. A. Parrock, MA. LL.D.	9	59	11,000
1915	Univ. of British Columbia	Vancouver, B.C.	None	F. F. Wesbrook, M.A.	32	377	30,000
1912	Univ. of Calgary	Calgary, Alb.	Non-Sect.	F. H. Dougall (Act.)	11	268	.....
1852	Universite Laval	Quebec	Non-Sect.	Mgr. Francis Pelletier, M.A.	70	474	100,000
1877	Univ. of Manitoba	Winnipeg, Man.	State	James A. MacLean, Ph.D.	43	881	12,790
1800	Univ. of New Brunswick	Fredericton, N.B.	State	Cecil C. Jones (Chan.)	15	150	40,000
1907	Univ. of Saskatchewan	Saskatoon, Sask.	State	Walter C. Murray, M.A.	53	445	12,000
1855	U. of St. Fran. Xav. Col.	Antigonish, N.S.	Catholic	H. P. MacPherson	22	186	22,000
1827	Univ. of Toronto	Toronto, Ont.	State	Robert A. Falconer, LL.D	401	4,428	141,936
1841	Victoria Col. & Univ.	Toronto, Ont.	Methodist	Rev. R. P. Bowles, M.A.	28	610	25,008
1873	Wesleyan Theo. Col.	Montreal, Can.	Methodist	Rev. J. Smyth, B.A.	4	100	5,000
1877	Wycliffe College	Toronto, Ont.	Prot. Epis.	N. W. Hoyles, LL.D.	8	102	.....

Government.—Canada is a self-governing dominion created by an Act of the British Parliament in March, 1867, known as the British North America Act. The Act provides that the Constitution of the Dominion shall be similar in principal to that of the United Kingdom; that the executive authority shall be vested in the Sovereign of Great Britain and Ireland, and carried on in his name by a Governor-General and Privy Council; and that the legislative power shall be exercised by a Parliament of two Houses, called the "Senate" and the "House of Commons."

Therefore, the executive government of Canada is vested in the king, who is represented by a Governor-General appointed by him for a term of five years. The emoluments of the Governor-General are, however, paid out of Canadian revenues.

The Governor-General has a right, which is, of course, very seldom exercised, to disallow or reserve bills for imperial consent. The Constitution of Canada cannot be altered save by the Imperial Parliament, but to all intents and purposes Canada has complete autonomy.

The Legislature.—The legislative power is a Parliament, consisting of an Upper House, styled the Senate, and a House of Commons.

The Senate consists at present of eighty-seven members, distributed between the various provinces thus: twenty-four for Ontario, twenty-four for Quebec, ten for Nova Scotia, ten for New Brunswick, four for Prince Edward Island, three for British Columbia, four for Manitoba, four for Alberta, and four for Saskatchewan. The members of the Senate are appointed for life by the Crown on the nomination of the Ministry for the time being; each nominee must be thirty years old, a resident in the province for which he is appointed, a natural born or naturalized subject of the king, and the owner of property amounting to four thousand dollars.

The House of Commons is chosen every five years at longest, and consists of two hundred and thirty-one members, elected as follows: eighty-two being elected for Ontario, sixty-five for Quebec, sixteen for Nova Scotia, eleven for New Brunswick, fifteen for Manitoba, eleven for British Columbia, three for Prince Edward Island, twelve for Alberta, fifteen for Saskatchewan, and one for Yukon. The House of Commons is also composed of natural born or naturalized subjects of the king; no property qualification is necessary, and its members are elected upon a very wide suffrage. The members of the House themselves elect their Speaker, and twenty, including the Speaker, form a quorum.

Each province has also a separate Legislature and administration, with a Lieutenant-Governor, appointed by the Governor-General, at the head of the Executive.

The Judicature.—Justice is administered, as in England, by judges, police magistrates, and justices of the peace, of whom the first named are appointed by the Governor-General, for life, from among the foremost men at the Bar in the several provinces. The highest court is the Supreme Court of Canada, composed of a Chief Justice and five associate judges, and holding three sessions in the year at Ottawa. The only other Dominion Court, viz., the Exchequer Court of Canada, is presided over by a separate judge, and its sittings may be held anywhere in Canada. The Provincial Courts include the Court of Chancery, Court of King's Bench, Court of Error and Appeal, Superior Courts, County Courts, General Sessions, and Division Courts. The duties of coroners are generally analogous to those in force in England, as are also methods of civil and criminal procedure, while trial by jury prevails.

Cities.—The capital and seat of government of the Canadian Dominion is at Ottawa, population, 1911, 87,062.

Montreal, however, is the largest city of Canada, 470,480. It has extensive trade and manufactures, and from it the magnificent Victoria tubular bridge carries the Grand Trunk Railway of Canada across the St. Lawrence, which is here two miles wide.

Quebec, 78.910, the capital of the lower province, is the great shipping place for the Lower St. Lawrence, and is a picturesque old town, with walls and fortifications. Near it are the memorable Plains of Abraham.

Toronto, 376,538, on the northwest shore of Lake Ontario, is the local capital of the western provinces and the educational center of the Dominion, possessing a university and numerous schools.

Other cities include: Winnipeg, Man., 136,035; Vancouver, B. C., 100,401; Hamilton, Ont., 81,969; Quebec, Que., 78,910; Halifax, N. S., 46,619; London, Ont., 46,300.

Ottawa is situated upon the south bank of the Ottawa River, one hundred and twenty miles from its junction with the St. Lawrence at Montreal. The river here forms the splendid Chaudière Falls (two hundred yards wide and forty feet high), above which a suspension bridge spans the river, and which supply the motive-power for the numerous lumber mills, flour mills and factories.

East of the city the River Rideau forms a second fall. The Rideau Canal passes through the center of the city, and connects with the Rideau Lakes, and so with the great lakes beyond. Opposite the city, to the northeast, the Gatineau River joins the Ottawa.

It is a city of stately public buildings, of turfed drives and wooded pleasure grounds, and there is a constant round of social and official events connected with the meetings of Parliament and other public functions. The Grand Trunk system has added to the attractions of the city by building the Chateau Laurier, which enjoys a continent-wide reputation as being in the first rank of famous hotels.

The parliamentary buildings, constructed in the Italian Gothic style after 1860, are on a bluff on the river bank. They include the handsome library building and the Victoria Tower (one hundred and eighty feet). Adjoining buildings on Parliament Hill are devoted to departments of the Dominion government. The residence of the Governor-General—an old fashioned building, called Rideau Hall—is about a mile from the city. The post-office, city hall, banks and telegraph offices are handsomely built of stone.

Ottawa is the place of residence of the bishop of Ontario (Church of Engand), and of the Roman Catholic bishop of Ottawa, who has a cathedral here. There are a normal school and a collegiate institute, a very large college conducted by the Oblate Fathers, a ladies' college, a musical academy, an art school, a well-equipped geological museum, and the parliamentary library, with three hundred thousand volumes.

The industries of Ottawa are mostly connected with lumber. In the winter thousands of men are engaged in cutting timber and drawing it to the streams, and in the spring the freshets carry the rafts down to the mills. Flour, iron wares, bricks, leather, and matches are also manufactured.

The city was begun in the last years of the eighteenth century by a settler named Wright, of Boston, Massachusetts, who built a residence near the Chaudière, and called the village which he founded Hull. The construction of the Rideau Canal stimulated the settlement, which was called Bytown. In 1854 its name was changed to Ottawa, and the town was created a city. In 1858 Ottawa was chosen as the administrative capital of Canada. The first parliament met here in 1865.

History.—In 1534 Jacques Cartier landed on the Caspé coast of Quebec, of which he took possession in the name of Francis I., king of France. Little was done by way of settlement till 1608, when Champlain founded Quebec. From this time till 1763 Canada, from Acadia (Nova Scotia) to Lake Superior and down the Mississippi to the Gulf of Mexico, was held to be French territory.

The struggle between Great Britain and France for supremacy was long and bitter, but ended in 1763 with the treaty of Paris, by which all the French dominions in Canada were ceded to Britain, save the small islands of St. Pierre and Miquelon, retained by France as fishing stations. Hudson Bay territory, Nova Scotia, and Newfoundland had passed to England by the treaty of Utrecht in 1713.

Through the American War of Independence, what is now Minnesota, Wisconsin, Michigan, Ohio, Indiana, and Illinois was lost in 1783 to the United States, no longer British colonies. Quebec was in 1791 divided into Lower and Upper Canada. A rebellion took place in 1837-1838, and the provinces were reunited in 1840. Prince Edward Island and New Brunswick were separated from Nova Scotia in 1770 and 1784. British Columbia was made a crown colony in 1858, and Vancouver Island joined to it in 1866. The confederation of all the British North American provinces—except Newfoundland—took place in 1867-1871, and the prosperity of the Dominion was only temporarily disturbed by the Red River rebellion of 1869.

The fishery rights have repeatedly been a source of controversy between Canada and Great Britain on the one hand and the United States on the other, and the dispute about sealing in Behring Sea and off the Alaskan coasts was only settled by arbitration in 1893. The Alaska boundary dispute was settled in 1903.

A proposed reciprocity agreement with the United States in the year 1911 saw the decisive defeat at the polls of the Laurier policy and the Liberal party. In October Robert L. Borden took over the reins of government, as Premier, and Earl Grey was succeeded as Governor-General by the Duke of Connaught. In 1916 the Duke of Devonshire succeeded as Governor-General.

The great European war of 1914 and following brought Canada to the vigorous support of Great Britain and the Entente Allies, and has done much toward the political, military and economic solidarity of the Dominion.

MEXICO (or *Méjico;* Span. pron. *Meh'hē-co,* from a native word), a federal republic of North America, embraces twenty-seven states, a federal district, and four territories. It extends between the United States and Guatemala, with an extreme length of nearly two thousand miles; its breadth varies between one thousand and (in the Isthmus of Tehuantepec) one hundred and thirty miles. It has a coast-line of almost six thousand miles, but with scarcely a safe harbor beyond the noble haven of Acapulco. On the Atlantic side, with its sand banks and lagoons, there are only open roadsteads, or river-mouths generally closed to ocean vessels by bars and shallows; harbor works, however, have been constructed at Vera Cruz and Tampico.

From the southeast and northwest extremities of the republic there extend the peninsulas of Yucatan and Lower California, enclosing the Gulfs of Campeche and California, respectively. In area (751,300 square miles) Mexico almost equals Great Britain and Ireland, France, Germany and Austria-Hungary together.

Surface.—For the most part Mexico consists of an immense tableland, which commences in the United States, and rises to over eight thousand one hundred feet at Marquez, seventy-six miles north by west of Mexico City; at El Paso, on the northern frontier, the elevation is only three thousand seven hundred and seventeen feet. The most important mountain range is the Sierra Madre (over ten thousand feet, and extending from Tehuantepec into the United States); parallel with this run the Sierras of the east coast and of Lower California.

The surface of the country is also much broken up by short cross-ridges and detached peaks. There are numerous volcanoes, but only a few of them are more or less active. The more prominent are Orizaba (Citlaltepetl, "star mountain"), Popocatepetl ("smoking mountain"); Ixtaccihuatl ("white woman"); Nevada de Toluca, and Malinche.

On the Atlantic side the plateau descends abruptly to the narrow strip (about sixty miles) of gently sloping coast land; toward the Pacific, where the coast lands vary in width from forty to seventy miles, the descent is more gradual.

Rivers and Lakes.—From their rapid fall the rivers of such a mountainous region could never be of value for transport or communication. The Rio Grande del Norte, the boundary river, is only navigable for sixty miles up from the Gulf of Mexico, and the largest interior river—the Rio Grande de Santiago, flowing west to the Pacific—is barred across by many waterfalls, though its upper course expands to form Lake Chapála, the largest sheet of water in Mexico, fully fifty miles in length.

Climate and Landscape.—Though Mexico lies just on the border of the torrid zone, the climate is governed to a far greater extent by elevation than by position in latitude, and distinct climates are recognized at different stages just as in the plateau of Abyssinia.

The low coast land and the maritime region below an elevation of two thousand feet, called the Tierra Caliente, presents all the characteristics of tropical lands.

Above an elevation of two thousand feet, and up the slopes of the mountains to a height of about five thousand feet, a climate is found in which the landscape takes the aspect of that of the temperate zone.

This stage is known as the Tierra Templada.

NATIONAL PALACE, CITY OF MEXICO

Still higher, above five thousand feet, a cool region is reached, which is known as the Tierra Fria. This includes the summit of the tableland and the pine covered slopes of the mountains up to the height at which some of the peaks are capped with perennial snows. Much of this high tableland is valuable only for pasture; towards the north and northeast, where the plateau is wider, the landscape becomes bare and dry, and salt lakes like those of the plateau region of the western United States appear. Deeply cut "cañons" or "barrancas," gorges with steep walls furrowed out by the mountain torrents, are characteristic of the plateau.

Production and Industry.—The vegetation of Mexico has the same wide range as the climate. In the lowlands dye woods and valuable timbers abound in the virgin forests, as well as medicinal plants, india rubber, palms, etc.; and oranges and bananas, many varieties of cactus, agave, sisal, olives, sugar, coffee, cocoa, rice, indigo, cotton and tobacco, besides the omnipresent maize, all thrive. The vine flourishes in some districts, especially near El Paso, Durango, and Parras, in Coahuila, where a good wine is made; and mulberry plants have been imported from Europe to develop the silk industry. In Lower California a good deal of archil is collected, and chicle gum is extracted and prepared in the forests along the coast.

Agriculture in Mexico is steadily developing. Silver mining has been an important industry ever since the conquest. Gold is also produced. Copper is largely mined in some sections, being found in a pure state in Chiapas and Guanajuato, and elsewhere associated with gold. Other important minerals are iron, including enormous masses of meteoric iron ore, and the mountain a mile from Durango, the Cerro de Mercado, a solid mass of magnetic iron ore; lead, found associated with silver; and sulpher, zinc, quicksilver, platinum, cinnabar, asphalt and petroleum, besides salt, marble, alabaster, gypsum, and rock salt in great quantities. There are also said to be large deposits of coal, some of excellent quality.

Mexico is the original home of the "cattle range" business, and there vast herds of horses, cattle, and sheep form the principal wealth of the people.

Woolen and cotton spinning and weaving, and other branches of industry are encouraged by high protective duties.

People.—The population of Mexico consists mainly of the indigenous Indian race, and of the dominant Spaniards or their descendants. Spaniards born in Europe are now very few in number, but the government of the country is in the hands of the "Creoles," or people of Spanish descent born in Mexico. They number about twenty per cent, mixed Hispano-Americans, or mestizos, forty-three per cent, and full blood Indians thirty-five per cent of the whole population. The mestizos are the farmers and rancheros, the muleteers and servants. Whites and mestizos speak Spanish.

The Roman Catholic is the religion of the country, but all beliefs are tolerated, and education, now free and compulsory, is making steady progress.

Government.—The Mexican constitution is closely modeled upon that of the United States. The president, who is assisted by secretaries of state, is elected for four years, and can be re-elected for a second term. The

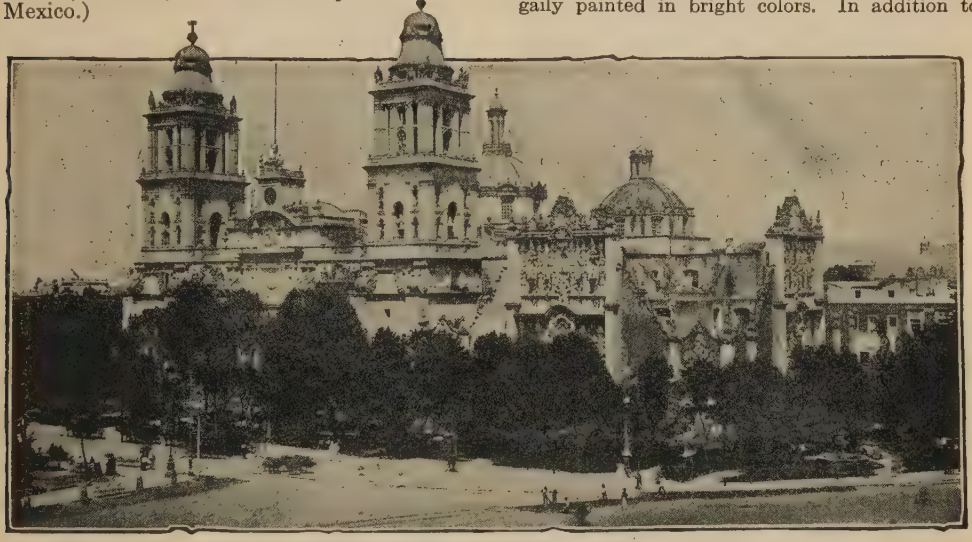
legislative power is vested in a Congress, consisting of a Senate of fifty-six members, and a Chamber of Deputies of two hundred and thirty-three members. The judicial system occupies the same position as that of the United States; and the several states have elective governors and legislatures.

Owing to revolutionary conditions the civil government was practically suspended in September, 1914. (See under History of Mexico.)

and the former palace of the Inquisition, now a medical college; and, mostly in secularized ecclesiastical edifices, there are also schools of law and engineering, a conservatory of music, and an academy of fine arts.

Among the monuments of the city are the noble Columbus monument, the statue of Cuauhtemotzin, the last of the Aztec emperors, and that of the engineer Martinez.

The principal streets are broad, clean, and well paved and lighted, with houses of stone gaily painted in bright colors. In addition to



THE CATHEDRAL, CITY OF MEXICO

Cities.—The principal cities are Mexico City, the capital, population 470,000. Puébla, east of the capital, among the mountains, is the second town and the most industrious place in Mexico. Guadalajara, northwest, is also a city of magnificent palaces and churches. Vera Cruz, founded by Cortez, is the only port on the Atlantic. On the Pacific side the chief seaports are Mazatlan and Acapulco, with a fine harbor. Other important towns are Oaxaca, Puebla, and Durango.

The railway system joins that of the United States at El Paso on the Rio Grande.

Mexico City is situated seven thousand four hundred and ten feet above the sea at the lowest level of the great basin (fourteen hundred square miles) of the Anahuac plateau.

All the main streets converge on the Plaza Mayor, where the site of the old teocalli is occupied by the no less famous Cathedral. The walls of this imposing building, forming a cross four hunderd and twenty-six by two hundred and three feet, alone cost nearly two million dollars, and the interior with its twenty chapels and elaborate ornamentation, much more. Built into the foot of one of the two open towers (two hundred and eighteen feet) is the famous "Aztec" (Toltec) calendar stone.

Facing the cathedral is the Municipal Palace, and on the sides of the plaza are the National Palace (the old vice-regal residence), the national Monte de Piedad, the postoffice, and the national museum.

Other noteworthy buildings are the national picture gallery and library (two hundred and fifty thousand volumes), the national observatory, the school of mines, the mint, the Iturbide hotel,

the alameda, with its stately beaches, Mexico is remarkable for the extent and beauty of its paseos, or raised paved roads, planted with double rows of trees, which diverge far into the country from every quarter; and there are still on Lakes Chalco and Xochimilco, where a line of steamers runs, a few of the floating gardens for which the ancient city was so celebrated.

Attempts had long been made to drain the valley of Mexico. The federal government finally undertook the work, and operations begun in 1890 were completed in 1898 at a cost of about sixteen million dollars. Extensive drainage and sanitation works have since been carried out at a cost of five million seven hundred and fourteen thousand nine hundred and eighty-two dollars.

In 1905 a sumptuous legislative palace, a national Pantheon for the ashes of the great men of Mexico, and a monument to perpetuate the heroes of the independence were under construction, at a cost of thirty million dollars.

The trade of Mexico is chiefly a transit trade, but it has now extensive cotton and linen factories, paper mills, tobacco and cigars, gold and silver work, pottery, silverware, cork, bricks, and soap—many of them due to foreign enterprise.

History of Mexico.—The history of ancient Mexico exhibits two distinct and widely differing periods—that of the Toltecs and that of the Aztecs. Both were Nahua nations, speaking a language which survives in Mexico to this day.

The eighth century is the traditional date when the Toltecs are related to have come from the north, from some undefined locality, bringing to Anahuac, or Mexico, its oldest and its highest native civilization, about 1325. A

hundred years later, under the reign of Montezuma II., they had attained a suzerainty over all the tribes from the Atlantic to the Pacific.

On the coming of the Spaniards under Cortez in 1519, Aztec rule was finally overthrown, chiefly by means of the assistance the Spaniards received from those peoples whom the Aztecs had held in cruel bondage.

In 1540 Mexico was united with other American territories—at one time all the country from Panama to Vancouver's Island—under the name of New Spain, and governed by viceroys (fifty-seven in all) appointed by the mother country, Spain. For nearly three centuries it may be said to have lain in sullen submission beneath its cruel conqueror's heel, till in 1810 the discontent, which had been gaining ground against the vice-regal power during the war of Spain with Napoleon, broke into open rebellion under the leadership of a country priest named Hidalgo.

In 1822 General Iturbide had himself proclaimed emperor; but the guerilla leader Guerrero, his former ally, and General Santa Anna raised the republican standard, and in 1823 he was banished to Italy with a pension. Returning the following year he was taken and shot, and the federal republic of Mexico was finally established.

For more than half a century after this (till 1876) the history of Mexico is a record of chronic disorder and civil war. In 1836 Texas secured its independence, for which it had struggled for several years, and which Mexico was compelled to recognize in 1845. In that year Texas was incorporated with the United States, and after the Mexican war of 1848 Mexico ceded half a million square miles to the United States.

The Emperor Napoleon III. declared war against the president, Juarez, in 1862; the Austrian Emperor of Mexico, Maximilian, imposed by the French, was executed in 1867, and the republic re-established. Diaz was re-elected president for the eighth time in 1910, but, being too autocratic, had to resign under pressure of revolution in 1911. In the ensuing welter of revolts and conspiracies President Madero was set aside and killed, and the United States applied pressure to eliminate President Huerta. From this time on the relations of the United States with Mexico became more strained. During 1915-1916, following repeated attacks made by bands of Mexican bandits upon American border towns and assaults by Mexicans upon Americans and other foreigners in Mexico, the relations between the two countries approached a crisis. Early in 1916 nineteen men, nearly all of them Americans, were taken from a train near Chihuahua and killed by a band of bandits.

Conditions became still more tense when, on March 9, several hundred bandits led by Villa raided and burned the town of Columbus, N. M., killing nine American civilians and eight United States soldiers. On March 10 President Wilson ordered five thousand United States troops into Mexico to catch Villa, and two days later the first troops crossed the border. On March 16 the first clash occurred between Villa outposts and the American expeditionary force. On June 18 the war department ordered all the state militia mobilized, and within the next two weeks fifty thousand of the state soldiers had been rushed to the border.

President Wilson later in the year named an American commission at the suggestion of General Carranza, which, jointly with a Mexican commission, began its sessions at New London, Conn. The sessions continued until November 24, when a protocol was signed providing for the withdrawal of the United States troops from Mexico in forty days, conditioned upon the Carranza Government showing within that time that it could protect the border and prevent raids by bandits upon American territory.

Two days before the signing of this protocol Villa, at the head of a strong force, attacked Chihuahua City, and after a battle lasting several days captured the city.

Carranza forces regained control of Chihuahua City December 3, and Villa's forces fled to the mountains west of the city, where they were later reported to be gathering new recruits in preparation for more extensive operations.

The year 1917 was ushered in with the struggle between the Carranza and Villa factions still in progress.

LEADING COUNTRIES OF SOUTH AMERICA

ARGENTINA, or ARGENTINE REPUBLIC, takes its name from the river La Plata ("River of Silver"). After Brazil, it is the largest state of South America. Its territory reaches from the Pilcomayo River, on the borders of Bolivia, southward for two thousand four hundred miles to Staten Island, off the southeastern extremity of Tierra del Fuego; and from the slope of the Andes on the west to the Uruguay River and the Atlantic in the east.

Physical Features.—Excepting on the northwest, where the spurs of the Andes reach down into the state, the surface of Argentina presents vast monotonous and level plains, broken only by the detached ridges of Córdova and San Luis, in the western interior. In the north the portion of the region called the Gran Chaco, within the frontier, is partly forest covered, but all the central and southern region presents only vast treeless plains or "pampas," covered at most seasons with coarse grass, which is green in the winter months, but which dries up in summer so as to give an aspect of aridity to the plains. Some portions of the interior, called "Salinas," are barren and white throughout the year.

Rivers.—The great watercourse of the country is the Paraná, formed by the union of the Upper Paraná and Paraguay rivers near the northeastern corner of the state. This is a noble river, in all parts of its course through Argentine territory scarcely ever less than a mile in width, and in some places spreading out in lateral channels, or "riachos," to a breadth of ten miles.

The Pilcomayo, which forms part of the northern boundary, has now been explored throughout its length, and is navigable at

high water; the Vermejo, the next river southward, has of late years become a regularly navigated highway from the Paraguay up to the northeastern provinces; the Salado, farther south, flowing directly to the Paraná, is also an important river; but the remaining streams which tend eastward to the Paraná have not strength of water sufficient to resist evaporation in crossing the dry plains, and terminate for the most part in marshes and salt lakes.

Climate.—The climate in the extreme north is very hot, for it lies north of the tropic of Capricorn. The more remote southern territories have an extremely disagreeable climate, but are not really so cold as might be expected from their relatively high latitude. But the country in general enjoys an equable, temperate, and healthful climate. Stormy southwest winds, called "pamperos," sweep over the plains at times, and raise great clouds of dust, which fly across the plains.

Production and Industry.—The principal productions are wheat, maize, oats, linseed, sugar, wool, hides, cattle, sheep, and horses.

The great wealth of the state, however, lies in its countless herds of cattle and horses and flocks of sheep, which are pastured on the "pampas," and which multiply there very rapidly. The rearing and tending of these herds is the great and characteristic industry of the country; these also yield enormous quantities of hides, horns, and salted beef.

The northwestern provinces of the Argentine Republic, crossed by the lower ramifications of the Andes, are rich in metals, including gold, silver, nickel, copper, tin, lead, and iron, as well as in several kinds of marble, jasper, and precious stones. On the Rio Vermejo petroleum wells have recently been discovered.

The export of frozen beef and mutton is an important industry. The exports are made up entirely of pastoral and agricultural products, with the exception of quebracho, copper, manganese, and wolfram.

People.—The people of the country are mostly Spanish in their language and descent, although there are many Italians, French, Americans, Swiss, and Germans. The Gauchos, or herdsmen of the plains, are a hardy and spirited, but ignorant race, often of partial Indian descent. Some of the Indians of the remote districts have become skilled in the rearing of flocks and herds.

The religion is Roman Catholic. The government is closely modeled upon that of the United States.

EDUCATION.—Primary education is secular, free and nominally compulsory from the ages of six to fourteen. Schools are maintained by provincial taxation, and controlled by provincial boards (except in the capital, where there is a National Council), with grants from the Federal Government. Secondary education is controlled by the Federal Government in lyceums and normal schools. There are also Special Government Schools—one naval, one military, one mining, and one agriculture. There are National Universities at Cordoba and Buenos Aires, and Provincial Universities at La Plata, Santa Fé, and Paraná.

Government.—The Constitution vests the executive power in the hands of a President, who is also Commander-in-chief of the troops, elected by representatives of the provinces for six years, not being immediately re-eligible; and the legislative authority in that of a Senate of thirty members, two chosen by the capital and two by the legislature of each province, and a House of Deputies of one hundred and twenty members elected for four years by the people, one-third of the Senate retiring every three years, and one-half of the House retiring every two years.

The Judicial system consists, like that of the United States, of a Federal Supreme Court and Courts of Appeal, with Provincial Courts in each state for non-national or single state cases.

Cities.—The chief seaport is Buenos Aires, the capital and largest city, with a population of 1,315,000 in 1911. La Plata lies twenty-five miles to the southeast of the Federal capital, and, although founded in only 1882, already numbers 80,000 inhabitants. A canal joins it to the vast docks of Ensenada.

Córdova (53,000), nearly in the center of the state, is the seat of the chief observatory of the Republic.

Rosario (135,000), on the right bank of the Paraná, more than two hundred miles up from the La Plata inlet, is a substantially built town, and a great outlet of the animal produce of the interior plains.

Tucuman (55,000) and Salta in the northwestern mountain region, and Mendoza (32,000) at the eastern base of the Andes, where they are crossed to enter Chile, with Corrientes (18,000) on the Paraná, are other important places.

Buenos Aires (*bwā'nōs ī'rez;* Sp. pron. *bwā'nōs ī'res;* Eng. pron. usually *Bonos Aī'rez*) stands on the right bank of the Plata, which here, at a distance of one hundred and fifty miles from the open sea, is twenty-eight miles across.

The city is partitioned into blocks of about one hundred and fifty yards square. The streets are regularly laid out at right angles to each other and well lighted. Many are planted with trees, and there are numerous open squares and several fine parks, the most famous being Palermo Park (eight hundred and forty acres). The main buildings are the Roman Catholic Cathedral, the chapel of Santa Felicitas, the Casa Rosada, or Government House, the university, the Opera House, and various government and municipal buildings. Much of the town has lately been rebuilt on European lines. It is the terminus of six railway lines, and has excellent street car, cable, and telephone services. There are manufactories of furniture, machinery, carriages, leather, hats, textiles, boots, tobacco, liquors, etc., and the trade is very large.

An elaborate system of harbor works was carried out between the years 1887 and 1895 at a cost of twenty million dollars; it includes an advanced river wall, a north and south basin, and a series of four docks, which connects two channels of the Rio de La Plata, and so brings large vessels up to the wharfs. About half of the inhabitants are of European birth or descent. Among the Europeans the vast majority are Italian; the rest are principally Spanish, French and British. Newspapers are published in French, English, Italian, and German, as well as in Spanish.

History.—The river La Plata was visited by the Spaniards in 1516, and the country was

colonized in 1535, when Buenos Aires was founded. For many years the country was regarded as a part of Peru. The progress of the colony was not more hindered by the bloody wars which prevailed with the natives for a hundred years than by unwise legislation at Madrid.

In 1776 Buenos Aires became the capital of a new viceroyalty. In 1806 that capital was occupied by a British force under General Beresford, but the town was soon besieged and compelled to surrender. In 1808 the British forces under Whitlock assaulted the town, but after very severe loss were themselves compelled to capitulate.

In 1810 the colonists founded a local provisional government. A sanguinary war for independence followed, which did not cease till 1824. Spain acknowledged the independence of the country in 1842. The first half-century of Argentine autonomy was much disturbed by revolutions.

The Brazilian-Argentine war against Paraguay (1865-1870) was interrupted and followed by renewed revolts at home. For a time the great material progress of the country was accompanied by an equally remarkable movement in favor of stability of government and the repression of factions. But once more dissensions and an insurrection in Buenos Aires led to civil war (1890), which again was followed by a disastrous financial panic (1891); and political and commercial crises, with riots and risings in various parts of the country, continued to succeed one another and to prevent progress. In May, 1910, the Argentine celebrated its centenary of independence.

BRAZIL (*brä-zil'*; Portuguese pron. *brä-zēl'*), a republic of South America, of which it covers nearly half, is little less in area than the whole of Europe, its area being 3,300,000 square miles, including the Acrá territory bought from Bolivia in 1902. It has a length of 2,660 miles, and a breadth of 2,705 miles between extreme points. It borders on every state in South America except Chile. The name was given by early explorers from thinking that the red dyewood (brazil-wood) found here was identical with the East Indian dyewood known to them as Brasil.

Surface.—This vast territory presents two contrasted regions. First, the wide, low lying, and humid forest plain of the Amazon River in the north; second, the uplands in the south, which are traversed by radiating hills and mountain ridges, and which present wide grass plains between woods and bush-covered country.

The northern coast is bordered by low, alluvial bottom lands and sandy plains, full of lakes, and in places very sterile; while the southern angle of the country is rolling campo land, bordered by a low sandy coast. Above its eastern angle a large area of coastlands and neighboring plateau is subject to periodical devastating drought.

The highest mountain ranges of Brazil rise in the center of the southeastern uplands, where the Montes Pyrenéos rise to nine thousand five hundred feet, but the coast range, or Serra do Mar, to the south of the beautiful Gulf of Rio de Janeiro, hardly yield to these, for within it the Itatiaiossu is scarcely six hundred feet lower, while the Organ Mountains, at the back of Rio, have summits which reach up to seven thousand five hundred feet.

Rivers.—Brazil possesses three great river-systems—the Amazon, La Plata, and San Francisco.

The Amazon and its tributaries drain fully a half of the country. To the east of the Madeira these tributaries are tableland rivers, broken by rapids and freely navigable for comparatively short distances. West of the Madeira they are lowland rivers, sluggish, bordered by extensive flood plains, and afford free navigation for long distances. The La Plata system drains nearly one-fifth of the country through its three branches—the Paraguay, Paraná, and Uruguay.

The first of these is a lowland river, freely navigable for a long distance, while the other two are tableland rivers, full of obstructions, and without free outlets for their upper level navigation.

The San Francisco is a tableland river, flowing northeast between the Goyaz and maritime mountains, and then, breaking through the latter, southeast to the Atlantic. It is not freely navigable because of the Paulo Affonso Falls. The other coast rivers are generally short.

Climate.—Brazil lies almost wholly within the tropics, and is still in great part unexplored and unsettled. The climate of Brazil varies greatly—the lowlands of the Amazon and a great part of the coast being hot, humid, and unhealthy, while the tablelands and some districts of the coast swept by the trade winds are temperate and healthy.

Production and Industry.—The minerals are very considerable and valuable, comprising gold, silver, iron, diamonds, topazes, and other precious stones. Its forests are immense, abounding in the greatest variety of useful and beautiful woods adapted for dyeing, cabinet work, or ship-building; among these are mahogany, logwood, rosewood, brazil-wood, etc.

Its agricultural produce is abundant; maize, beans, cassava root, and nuts are very generally cultivated; also, in some parts, wheat and other European cereals.

Cattle raising is an important industry, the number being computed at eighteen million. Cotton is being largely cultivated for export, and is being used for home manufactures. Sugar cane is grown in large and increasing quantities in the northern provinces, Pernambuco being the center of the sugar-producing zone.

India rubber comes from the more northern provinces, especially the valley of the Amazon, and is shipped from Pará and Manáos; and coffee, though also grown in the north, comes chiefly from Rio de Janeiro, Minas, São Paulo, and Esperito Santo. Tobacco and cocoa are grown largely, especially in Bahia. The exports consist solely of the raw produce of the soil.

People.—The inhabitants of Brazil, as of other parts of South America, present three great elements—that of the aboriginal Indians, that of the European conquerors and colonists and their descendants, and that of the Africans

introduced as slaves. The most important section of the Brazilians are the descendants of the Portuguese settlers. There are, however, several flourishing German and Italian colonies in the southern states.

The number of pure white people is very small in proportion to those who have some mixture of Indian or African blood, and the Brazilians themselves have developed into a number of more or less distinct physical types in the widely separated provinces of the republic. Formerly about one-half of the entire population of Brazil was formed of negro slaves.

The Roman Catholic is the established religion, and is supported by the state; but all other sects are tolerated. There are, however, very few Brazilians who are not Roman Catholics.

Education is still in a very backward condition. The language is Portuguese, with dialectal varieties.

Government.—According to the new Constitution of 1890, the empire was abolished and the Brazilian nation is constituted a Federal Republic under the title of the United States of Brazil, each of the twenty provinces forming a separate state with local self-government. At the head of the federation is a president with executive authority, elected by the people for six years. The National Congress with legislative functions comprises a Senate and Chamber of Deputies, the senators being chosen three for each state, for nine years, the deputies for three years in the proportion of one to every seventy thousand of the population. The franchise extends to all citizens not under twenty-one years of age.

Cities.—The capital city is Rio de Janeiro, the second largest in South America. Next in importance is the city and seaport of Bahia (230,000), finely placed on an inlet of the Atlantic, the oldest city of Brazil. Pernambuco, also called Recife from a reef of rock which forms the natural breakwater of its harbor, is the fourth in population, being now surpassed by São Paulo, which ranks next to the capital (332,000). Maranhão, on an island of the north coast; Pará, in the Tocantins estuary; Rio Grande, and Santos are the other notable places along the Atlantic. In the interior the principal towns are Ouro Preto, in the gold mining region, and Diamantina, the center of the diamond fields. Cuyabá, in the interior, is important as being at the head of the regular navigation into Brazil by way of the Paraná and Paraguay rivers.

Rio de Janeiro (*Ree'o deh Zha-nay'e-ro*) stands on the west side of one of the most magnificent natural harbors in the world. An inlet of the Atlantic, the bay of Rio de Janeiro runs fifteen miles northwards, varying in width from two miles to seven; it is girdled on all sides by picturesque mountains (one thousand five hundred to three thousand feet), covered with tropical vegetation. The entrance, less than a mile wide, passes between two bold headlands, one of them called the Sugar-loaf (one thousand two hundred and seventy feet).

The city and its suburbs stretch nearly ten miles along the shore. About three miles southwest of the city stands the precipitous cone of Corcovado (two thousand three hundred and thirty-six feet), with a cog-railway up to the top. Public institutions are the vast hospital of La Misericordia; the national library with three hundred thousand volumes; the national museum; the large lunatic asylum; the botanical gardens, with a celebrated avenue of palms; the observatory; the Geographical and Historical institute; the former royal palace at São Christovão, the arsenal, the naval dockyards, the academy of fine arts, a cadet-school, a school of medicine, a conservatory of music, a polytechnic school, etc. A good water supply, chiefly by an aqueduct twelve miles long, and a new system of sewage draining, much improved the city health; but surrounding hills shut out the breezes, and the heat grows intense in summer.

The population includes many foreigners: Portuguese, British, French, and Germans.

Rio de Janeiro is also the commercial capital, sending out one-sixth of the total exports of Brazil, and bringing in forty-five per cent of the imports. The chief export is coffee.

The whole sea frontage of the city is lined with quays, and has been improved by extensive new harbor works, embracing a dock of seventy-five acres, a breakwater three thousand two hundred yards long, an elevated railway, hydraulic cranes, warehouses, etc.

The city possesses cotton, jute, and silk mills, tobacco and hat factories, machine shops and tanneries.

History of Brazil.—As early as 1480, expeditions sailed from Europe in search of the island of Brasil, rumored to exist in the western seas. Brazil was discovered on January 26, 1500, by Vincent Yañez Pinzon, who landed at Cape St. Augustine, near Pernambuco, and then followed the coast north to the Orinoco. In the same year a Portuguese expedition to the East Indies, under Pedro Alvarez Cabral, discovered the Brazilian coast near Porto Seguro on April 25 (April 22, Cazal). Cabral took formal possession, and named his new discovery "Terra de Vera Cruz." Two Portuguese expeditions were sent out in 1501 and 1503, the first exploring the coast, and the second planting a colony and bringing back a rich cargo of brazil-wood, which gave a name to Portugal's new possession.

In 1530 the Portuguese government resolved upon the definite settlement of Brazil. Many of the earliest colonies failed through lack of means, and from inability to hold their ground against the natives. In 1567 a Huguenot colony, established on the bay of Rio de Janeiro twelve years before, was overthrown by the Portuguese, who then founded the present capital of Brazil.

The discovery of gold in Minas Geraes in 1693, and of diamonds in 1729, gave a new impetus to the growth of the country, one result of which was the removal of the colonial capital from Bahia to Rio de Janeiro. The cultivation of cotton, tobacco, and sugar cane had already attained great prominence and prosperity.

In 1808 the royal family of Portugal was expelled by the French and took refuge in Brazil, and the very first act of Dom João VI. was to open Brazilian ports to foreign commerce. He then removed various restrictions on domestic industries, founded a printing office and library, created new courts, and opened various schools and public institutions. All these acts greatly stimulated the growth of the country.

In 1821 he returned to Portugal, leaving his eldest son in Brazil as prince regent. Personal ambition, and the advice of men opposed to government from Lisbon, led the young prince to declare for Brazilian independence, September 7, 1822. He was proclaimed and crowned emperor as Dom Pedro I. before the end of the year, the small Portuguese force in the country being quickly and easily expelled. The constitution was ratified and sworn to early in 1825, and some amendments were added in 1835.

The new empire, however, did not start smoothly, nor was the reign of Dom Pedro I. a fortunate one. Vexed with the opposition encountered, he in 1831 voluntarily abdicated in favor of his eldest son, and withdrew to Portugal. During the next nine years Brazil was governed by regencies, but in 1840 a popular agitation led to the declaration of the young prince's majority, at fifteen years of age, and to his coronation the following year as Dom Pedro II. The reign was one of almost unbroken peace, interrupted by two wars—one with Buenos Aires in 1852, and the other with Paraguay in 1865-1870.

At the revolution of November, 1889, the empire became a republic, and Dom Pedro and his family were exiled. Under the new and enlightened constitution and a succession of patriotic presidents, Brazil has enjoyed a season of peace and prosperity such as it has not experienced since its colonial times. In 1904 the third Pan-American congress was held in Brazil, and did much to bind closer the bonds existing between her and the other American republics.

CHILE (*Tchee'lee;* Span. *Chile*, pron. *Tchee'lay*), is one of the republics of South America, on the west coast, and borders on Peru, Bolivia, and Argentina. It reaches from the southern boundary of the coast line of Peru to the southern extremity of Tierra del Fuego, through a distance of about two thousand eight hundred miles, rising inland to the summits of the Andes, which here form a single chain at a distance of about one hundred miles from the ocean. The Strait of Magellan is by treaty considered neutral as between Chile and Argentina. Its breadth varies from forty to two hundred miles.

Physical Features.—The range of the Andes, visible from the sea all along the coast of Chile, towers up in a series of volcanic cones and snowclad peaks; the loftiest summit, that of Aconcagua, being probably the highest point of all the South American continent.

Numbers of streams descend from the range, and have furrowed deep valleys across the width of the country. The most considerable of these are the Maypú near the center of Chile, and the Maule and Biobio in the south, both of which are to some extent navigable.

In the south are also many deep lakes. Mineral waters, chiefly saline and sulphureous, are abundant. The most important islands are those constituting the southern province of Chiloé; Juan Fernandez also belongs to Chile.

Climate.—This long strip of maritime country presents remarkable gradations of climate from north to south. Nearest the Peruvian frontier the coast-land of Tacna, Tarapacá, and Atacama is a hot, rainless, sandy desert without sign of vegetation. Southward is found a temperate climate which enjoys a moderate rainfall. This central belt is the most valuable and the most productive agricultural region of Chile. Farther south the westerly winds blow toward the mountains from over the wide Pacific and bring with them such quantities of moisture that the rainfall is excessive; here, in southern Chile, in consequence of the abundant moisture, the mountain slopes are densely covered with evergreen forest.

Production and Industry.—Agriculture and mining are the principal occupations. Wheat, maize, barley, oats, beans, peas, lentils, wines, tobacco, flax, hemp, Chile pepper, and potatoes are grown extensively; the vine and all fruit trees flourish. The live stock includes cattle, sheep, horses, goats, and pigs. The mineral wealth is considerable, the country being extremely rich in copper ore, and some rich gold mines have been discovered. The rainless north yields more especially nitrate of soda, iodine, borate of soda, gold and silver, a large number of mines yielding both being in actual work in Tarapacá, Guanaco, and Cachinal in Atacama, and Caracoles in Antofagasta; the center, copper and silver; and the south, iron and coal. The nitrate exports are extremely valuable. There are smelting works for copper and silver, tanneries, corn and saw mills, starch, soap, biscuit, rope, cloth, cheese, furniture, candle, and paper factories, breweries and distilleries; and the domestic industry furnishes cloth, embroideries, baskets, and pottery. The many ports favor commerce, and six lines of steamers connect the country with Panama and the Magellan Strait. The staple articles of export are nitrate of soda, iodine, copper bars and ores, silver ores, corn, flour, hides, and guano.

People.—The inhabitants of northern and central Chile are, for the most part, descendants of the intermixed Spaniards and native Indians. In the upper classes the race has been kept more purely Spanish than in any other South American country.

Chile is a Roman Catholic country, but other religions are tolerated. Education receives much attention. There is a first class university at Santiago, and a lyceum in every provincial capital. The language spoken in Chile is Spanish, but with many local words of Indian origin.

Government.—Under the constitution voted in 1833, Chile is governed by a president who is elected for five years by delegates nominated by ballot, who is not re-eligible. A Senate and Chamber of Deputies form the legislature. The Senate, of thirty-two members, is elected by the provinces for six years; the Chamber, of ninety-four members, by the departments for three years, by electors over twenty-one, and able to read and write.

Cities.—Santiago, the capital, has 350,000 inhabitants; Valparaiso, 180,000; Concepcion, Iquique, Talca, Chillan, Antofagasta, over 30,000.

Santiago (*San-tee-âh'go*) stands near the western base of the Andes, one thousand seven hundred feet above sea-level, and one hundred and fifteen

miles by rail east by southeast of Valparaiso. The snow-capped mountains seem to enclose it on the north and east; while in the east of the city rises the picturesque park, Cerro de Santa Lucia (eight hundred feet above the plain), dotted with grottoes, statues, kiosks, restaurants, an historical museum, and an observatory. The small but turbulent stream, the Mapocho, is crossed by five bridges.

The city is regularly laid out, lighted with gas and electric light, and has electric railways in all directions. Most of the houses are of one story only, owing to the earthquakes (the most serious occurred in 1575, 1647, 1730, 1822, 1835, 1906).

On the great Plaza Independencia are the government palaces, the Grand English Hotel, the cathedral, and the archbishop's palace. On the site of the Jesuit church, burned down in 1863, a monument was erected in memory of the two thousand worshipers who perished in the fire.

Santiago boasts a noble Alameda, or boulevard, adorned with four rows of poplars and statues. Facing it are the University and the National Institute. The city has also a military school, schools of arts and agriculture, a conservatory, a national library with one hundred and two thousand volumes; botanical and zoölogical gardens, etc.

The manufactures include cloth, ship's biscuits, beer, brandy, etc., and it has also an ice factory, a fruit-conserving establishment, and copper-smelting works.

Santiago was founded by Pedro de Valdivia in 1541.

History of Chile.—The name Chile is supposed to be derived from an ancient Peruvian word signifying "snow." The first European to land in Chile was the Portuguese discoverer Magellan, after his famous voyage through the strait which now bears his name. He landed at Chiloé in 1520.

After the conquest of Peru by Pizarro, an expedition was made to Chile from that country overland under the leadership of Diego de Almagro in 1535. This expedition penetrated as far as the Rio Clano, but returned unsuccessful. Another was sent under command of Pedro Valdivia in 1540, which succeeded in annexing the territory as far as the River Maipu. Santiago, the capital, was founded by Valdivia in 1542. During the colonial period the governors of Chile were appointed by the viceroys of Peru.

In 1810 a revolt against the Spanish power broke out, in which Don Bernardo O'Higgins, son of one of the last viceroys of Peru, but a native of Chile, played a conspicuous part, and finally became the first dictator of the new republic. The first constitutional president was General Blanco Encalada. The government was unsettled until 1847. A revolution broke out in 1851, but since then there has been no serious attempt to overturn the government by force of arms.

In 1864 Chile gave Peru very valuable support in her war with Spain. Valparaiso was bombarded by the Spaniards in 1866. In 1879 Chile declared war against Bolivia, and immediately thereafter against Peru, with which Bolivia was allied. For a time the Peruvian fleet kept the Chileans in check, but in August, 1879, the Peruvian ironclad *Huascar* was captured by the Chilean men-of-war *Cochrane* and *Blanco Encalada*, both armor plated. After this event the success of the Chileans was uninterrupted—Peruvian towns were bombarded, warships captured, and Lima taken by storm June 21, 1881. The Chileans occupied Lima and Callao until 1883, when a treaty of peace was signed.

President Balmaceda's unconstitutional government led to civil war in 1891, when the congressionalists were victorious. The decisive battle was fought near Valparaiso on August 28, and Balmaceda committed suicide.

In September, 1910, the centennial celebration of the first declaration of independence from the Spanish crown took place, many foreign governments sending special delegations.

LEADING COUNTRIES OF ASIA

CHINA, or more accurately the Chinese Republic, is an extensive dominion of Eastern Asia of which China proper constitutes the principal portion. For centuries this dominion has been known as the Chinese Empire, and it is still frequently referred to as such, although the form of government is now republican. China includes a number of dependencies or subject territories, viz.: Manchuria, Mongolia, Tibet, East Turkestan, and the small territories between Mongolia and Tibet.

By its natives China is never so called, but usually by the Chinese words for "The Middle State," or "The Republic of the Middle Flower." The name China (*Chi-na*, land of Chin) comes to us from India through Buddhism. Various old names are Serica and Cathay, and in the Bible "Land of Sinim."

China and its dependent territories have an area of 4,300,000 square miles. The population of the whole is variously estimated at from 300,000,000 to 440,000,000. The great bulk of this falls to the provinces of China proper; the population of all the dependencies (Manchuria, Tibet, Mongolia, East Turkestan), making but some 16,000,000 or 25,000,000 of the total.

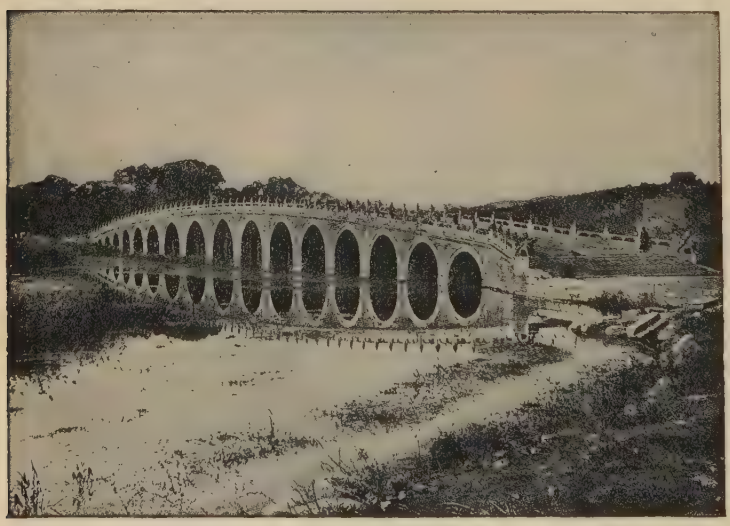
Surface.—Occupying all the central and eastern portion of the continent of Asia, the limits are for the most part very distinctly marked out by great natural features. The boundary with Russian Siberia on the north runs along the Amur River and the crests of the Sayan and Altai Mountains; towards western Turkestan the alpine heights of the Thian Shan and the Pamir form the limit; the snow clad Himalaya range separates China from the hot plains of India in the south, and the mountains of Yunnan continue the natural frontier eastward again to the coasts of the Pacific.

Within these wide exterior limits China includes a number of regions, some of which are strongly contrasted with one another in their natural features and in the character of their population. Along the eastern or maritime border, where the rivers flowing down from the mountain region of the interior have spread out in wide alluvial plains next the sea, lie China proper and Manchuria, filled with a teeming population of busy agriculturists and townsfolk. Within, on the high plateau of Central Asia, the region of bare steppes and deserts, and the mountain skirts round it, are the countries of Mongolia, Eastern

Turkestan, and Tibet, thinly peopled for the most part by nomadic pastoral tribes.

China Proper may be described as sloping from the mountainous regions of Tibet and Nepal toward the shores of the Pacific on the east and south. The most extensive mountain range in it is the Nan Ling or Southern Range, a far extending spur of the Himalayas. Commencing in Yunnan, it bounds Kwangsi, Kwangtung, and Fukien, on the north, and, passing through Chekiang, enters the sea at Ningpo.

HUNCHBACK BRIDGE, NEAR PEKING, CHINA



BRIDGE AT YUEN-MING-YUEN, CHINA

North of this long range, and west of the one hundred and thirteenth meridian, on to the borders of Tibet, the country is mountainous, while to the east and from the great wall on the north to the Po-yang Lake in the south, there is the Great Plain, comprising the greater part of the provinces of Chihli, Shantung, Honan, Anhui, and Kiangsu. The Great Plain extends on both sides of the lower Hoang-ho, between the great cities of Peking and Nanking, over an area more than three times as extensive as England. Sedulously irrigated or drained, and cultivated in every corner, this great plain supports the densest agricultural population in the world.

In the provinces west from Chihli—Shansi, Shensi and Kansu—the soil is formed of what are called the loess beds, which are extremely fertile, the fields composed of it hardly requiring any other manure than a sprinkling of its own fresh loam. The husbandman in this way obtains an assured harvest two and even three times a year. This fertility, provided there be a sufficient rainfall, seems inexhaustible.

Seas, Rivers and Canals.—The semi-mediterranean seas and gulfs of the Pacific along the coasts of China are distinguished by separate names. In the north, between the Korean peninsula and the mainland of China, is the Hoang Hai or Yellow Sea, three hundred miles wide, named from the lemon color of its waters, filled with the alluvium brought down to it by the Hoang-ho, and so shallow that its muddy bed is frequently furrowed by passing vessels. Within or northward lie the Bay of Korea and the Gulfs of Pechihli and Liaotung, the two last separated almost entirely from the outer China Sea by the projecting promontories of Shantung and Liaotung. South of the Yellow Sea, between the mainland and southern Japan, with the chain of the Luchu Islands and Formosa, extends the wider Tung-

GREAT CHINESE WALL,

erected to protect the ancient empire from the inroads of nomadic Tartars about 214 B. C. The main substance of the wall is earth or rubbish, retained on each side by a strong casing of stone and brick, and terraced by a platform of square tiles. The thickness of the wall at the base is often as much as twenty-five feet. (See full description below.)

hai or Eastern Sea; and from this the Fukien Channel, between Formosa and the coast of China, one hundred miles wide, leads into the great mediterranean called the Nanhai or South Sea of China, which is almost completely shut in by Borneo and the Philippine Islands. The coasts of the Yellow Sea bordering on the great plain are low and flat; southward thence to the Island of Hainan the shores of China rise steep, and are dotted round with rocky islets.

The rivers of China—called for the most part *ho* in the north, and *chiang* (*kiang*) in the south, are one of its most distinguishing features.

Two of them stand out conspicuous among the great rivers of the world: the Ho, Hoang-ho, or Yellow River, and the Chiang, or Yang-tze-kiang. They rise not far from each other among the mountains of Tibet. The Ho pursues a tortuous course seaward through North China; the Chiang or Yang-tze through Central China. The terrible calamities caused by the inundations of the Hoang-ho have procured for it the name of "China's Sorrow." The Ho is not much under the Chiang in length—somewhat over three thousand miles.

Besides these may be noted the Pei-ho, which gathers the waters of the northern portion of the great plain, and forms a highway of communication between the capital city of Peking and the port of Tien-tsin, thirty-five miles above its mouth; the Min, the river of the province of Fukien, by which the Bohea teas are brought down to the port of Fu-chou; and the Si-kiang, the largest river of southern China, one of the delta branches of which forms the Chu-kiang, or river of the great port of Canton.

The three largest lakes of China lie immediately south of the course of the Yang-tze. The Tung-ting-hu, seventy miles long, and the Poyang-hu, nearly as large, are expansions of the mouths of the chief southern tributaries of the Yang-tze in Central China; the third, the Tai-hu, lies south of the estuary.

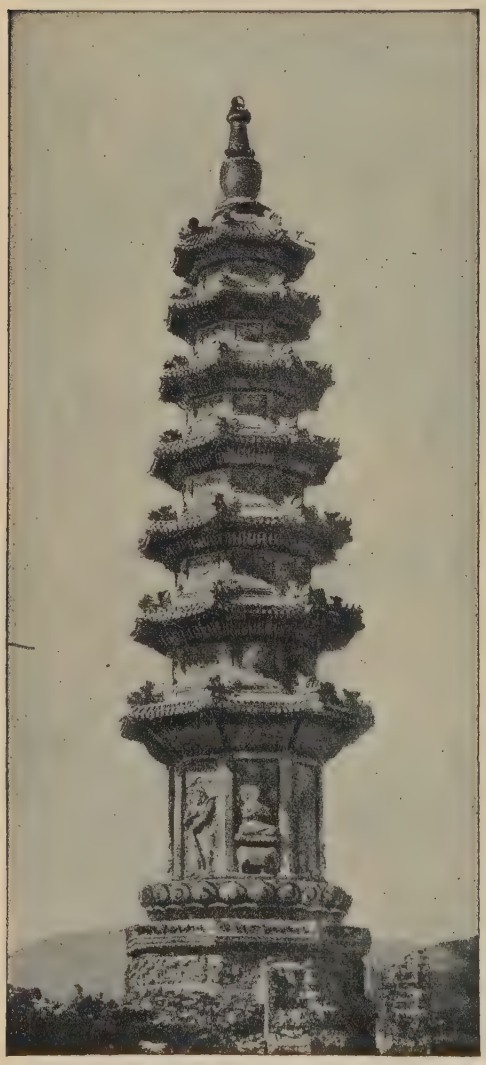
Canals.—Greatest of all the public works in China is the Grand Canal, which traverses the great plain for a distance of seven hundred miles, passing from Tientsin, on the Pei-ho, in the north, across the course of the Hoang-ho to the lower course of the Yang-tze, connecting a system of water communications which extends from the capital to the chief parts of the empire. It is but the greatest sample of the system of canals, great and small, which form a network over all parts of the lowlands of China. Steam communication, however, all along the eastern seaboard from Canton to Tientsin has now very much superseded its use.

The glory of making this canal is due to Kublai, the first sovereign of the Yüan dynasty.

After the Grand Canal, as a gigantic achievement, comes the Great Wall, on the north side next Mongolia. Not so useful as the canal, and having failed to answer the purpose for

which it was intended—to be a defense against the incursions of the northern tribes, there it still stands, the most remarkable artificial bulwark in the world.

It was in 214 B. C. that Shih Hwang Ti determined to erect a grand barrier all along the north of his vast empire. The wall commences at the Shanhai Pass and extends westward continuously almost into the heart of the continent for a distance of one thousand five hundred miles, over mountain and valley, and across rivers and ravines. It is a rampart of earth, ten to thirty feet high, broad enough at the top to admit of several horsemen passing abreast, and was formerly cased on the sides and top with bricks and stones, and was flanked by numerous projections or towers, gates being left at intervals for the passage of travelers and the collection of customs. Now it has fallen in many places, and its gates are negligently guarded, and northward of Peking the growing Chinese population has spread and settled the country to a considerable distance beyond its barrier.



PAGODA, NEAR PEKING, CHINA

The Pagoda, or "idol temple," in China, usually distinguishes the Buddhist from the Confucian temple. It is a tapering tower, always with an odd number of stories. First-class padodas have seven, nine, or thirteen stories, minor ones have three or five. The most famous was the Porcelain Tower of Nanking, erected in the beginning of the fifteenth century; only nine of the proposed thirteen stories, cased in white porcelain, were completed, and the height never exceeded about two hundred and sixty feet. It was destroyed by the Taipings in 1856.

Climate.—The climatic conditions naturally vary considerably over so large a stretch of country. In the lofty Tibetan plateau and the less elevated plains of Mongolia, the climate is exceedingly dry, and is marked by great extremes of hot and cold. The basins of the two great rivers, being nearer the Pacific, are moister and more equable. In this part of China proper the dry season lasts from November to February, the remaining months, particularly May, being extremely wet. The rainfall is of a copious tropical nature.

Generally speaking, China is a cold country in comparison with other regions in the same latitude. From July to September, however, the weather is intensely hot, and the heat is accompanied by typhoons, which are much dreaded for their violent and devastating effects.

Production and Industry.—Agricultural pursuits occupy the majority of the people, the chief products being tea, silk, indigo, cotton, cereals, rice, and sugar. Agriculture is held in higher estimation here than in any other land in the world. The land is freehold, and is held by families in small holdings.

There is much coal in all the provinces, and iron ore is also plentiful in Shansi. Copper ore is plentiful in Yunnan. Southern Yunnan also furnishes a variety of precious stones—rubies, amethysts, sapphires, topazes, opals, besides malachite, and the steatite or soapstone, in which the Chinese carve figures of all sorts.

The much prized Yu, or *jade*, brought formerly from Turkestan, comes now from the Hoang-ho valley; lapis lazuli (for the preparation of ultramarine) is found in the mountains of Che-kiang, in the east coast region. Large beds of porcelain clay occur in this province also, and in its neighboring one of Kiang-si.

About one-fourth of the world's supply of new silk comes from China. Cotton and wool mills, flour and rice mills are important industries.

Before European manufactures had reached their higher development, fine "Nankeen" calico was largely imported from China to Europe. "China ware," or porcelain, was first made by the Chinese, and so ignorant were the early Portuguese traders of its value, that they called it "porcellana," believing it perhaps to be made of shells; the secret of its manufacture was not discovered till the beginning of the eighteenth century. In the province of Kiang-si, not far from Yao-chou, there are porcelain factories which were founded by an emperor in 1004 A. D.

The Chinese also excel in carpentry; paper

making from the bamboo was invented among them as early as the second century B. C. They are highly skilled in the use of metals; bronze vases exist which date from 1760 B. C., and the great bells on the towers of Peking, cast during the Ming dynasty. are still perfect; the sonorous gong metal alloy is as yet a Chinese secret; in their delicate embroideries, carvings in ivory, engravings on wood and stone, lacquered wares, and rich silks and satins, they show astonishing handicraft.

Besides these three national systems, Mohammedanism has numerous adherents in the northern and western provinces.

There are temples of Confucius in every great town, and twice a year, in spring and autumn, sacrifices of animals, fruit, and wine are offered in honor of the sage.

The majority of the Tâoists, or followers of Laotse, imitate the Buddhists in their monastic life, and many of them live as hermits in the mountain caves of the upper Yang-tze, or in the most romantic spots of the mountains of China.

VIEW OF THE ROCK-HEWN TEMPLES AT LUNG-MEN

Here, as early as the seventh century, Chinese artists sculptured religious figures in the recesses of precipitous cliffs—similar to those of Upper Egypt—and turned them into hundreds of quarried temples. The huge Buddha and attendant figures in the central recess can be clearly seen. Many smaller figures and decorations in other recesses can also be discerned.

People, Religion and Education.—The Chinese, as we have seen in the Book of Races, belong to the Mongolian race. They are stout and muscular as compared with other eastern peoples, temperate, industrious, cheerful, and easily contented; but they are addicted to gambling.

The dress of the poor is very much alike in both sexes; and though it is regulated for all classes by sumptuary laws, it is varied among the wealthy by the richness of the materials and the various ornamentation.

The three chief religions of China are Confucianism, Tâoism, and Buddhism. It is difficult to estimate the comparative number of their adherents. To claim a majority for those of any one of them is very absurd. As a matter of fact, Confucianism represents the intelligence and morality of China; Tâoism its superstitions; and Buddhism is ritualism and idolatry, while yet it acknowledges no God.

The Grand Lama of Tibet is the pope of the Buddhist Church, but the priests in China have no political power, and are viewed with contempt by the literary and governing classes. In Peking, however, several large monasteries of Tibetan and Mongolian Buddhists are supported at the expense of the government.

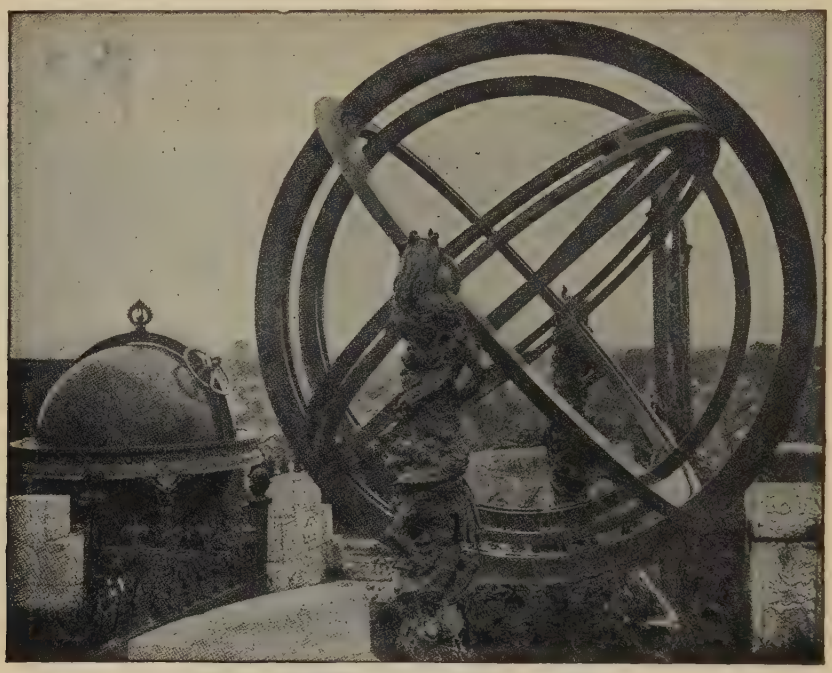
The native Roman Catholics of China are said to number more than a million, but Protestants are very few.

In 1906, after the Russo-Japanese war, a new system of compulsory primary education was established. The curriculum is largely based upon the Japanese. Modern sciences, history, geography, and foreign languages are taught. Special schools have been established (technical, agricultural, normal, language, etc.). Thousands of temples have been converted to educational purposes. Old style examination

halls have been pulled down, and colleges built on the sites. The educational facilities are, however, very inadequate. Girls' schools, formerly non-existent, are still very few in number. The only government medical school is an army one, but the government has recognized the Union Medical College, opened in Peking by the Protestant missions there. Many Chinese students have proceeded to Japan, America, and Europe to study there. The government is using the money returned by the American government from the Boxer indemnity to send students to America.

There is a university in Peking and a number of colleges under foreign management. In 1911 there were five hundred and forty-five foreigners employed in educational work.

Government.—Until February 12, 1912, China was a monarchy, in practice almost absolute. Since that day it has been a republic under a president who holds office for a term of five years. Many changes were made at the time of the revolution. A cabinet was substituted for the old grand council, grand secretariat, and government council; the cabinet being composed of a prime minister, two associate ministers, the various ministers of state, and the heads of various boards. A privy council was also formed. Administration is carried on by the following ministries: (1) Of Foreign Affairs; (2) Interior; (3) Finance; (4) Education; (5) War; (6) Marine; (7) Justice; (8) Agriculture, Works, and Commerce; (9) Posts and Communications; (10) Colonies. There are also a large number of minor boards and offices, divided into twenty-two provinces for local administration.



ROYAL OBSERVATORY, PEKING , CHINA

The Chinese were among the very earliest observers of the heavens, though the Hindus, Chinese, Chaldeans, and Egyptians each claim the honor of having been the first students of astronomy. The Chinese have astronomical annals claiming to go back two thousand eight hundred and fifty-seven years B. C. These record little but the appearance of comets and solar eclipses. Professional astronomers were compelled to predict every eclipse under pain of death. The popular idea was that an eclipse was a monster having evil designs on the sun, and it was customary to make a great noise, by shouting, etc., in order to frighten it away. At an early period the Chinese appear to have been acquainted with the luni-solar Metonic cycle of nineteen years, and they had also divided the year into three hundred and sixty-five and one-fourth days. To the burning of all scientific books by one of their princes (Tsin-Chi-Hong-Ti), 221 B. C., the Chinese attribute the loss of many theories and methods previously in use.

Cities.—There were in 1910 about twenty-three towns with populations exceeding 50,000, but all figures are based upon estimates.

Peking	1,000,000	Chinkiang	200,000
Canton	1,250,000	Antung	150,000
Hankow	900,000	Wuhu	130,000
Tientsin	850,000	Amoy	120,000
Shanghai	700,000	Wenchow	100,000
Fuchow	650,000	Swatow	90,000
Chungking	600,000	Chefoo	90,000
Suchow	500,000	Shasi	85,000
Ningpo	450,000	Ichang	70,000
Hangchow	400,000	Kongmun	60,000
Nanking	300,000	Wuchow	60,000
Changsha	250,000	Niuchwang	50,000

Peking, or Pei-Ching ("Northern Capital") is situated in a sandy plain, and is surrounded by walls with sixteen gates, each surmounted by towers one hundred feet high; and it consists, in fact, of two cities—the inner and the outer—known also as the Manchu or Tartar and the Chinese, the northern and the southern.

The walls of the Manchu city average fifty feet in height, and are fully sixty feet wide at the

bottom; those of the Chinese city (rectangular in plan) are thirty feet high and twenty-five feet wide. The circuit of the two cities measures twenty-one miles, including an area of nearly twenty-six square miles.

The Manchu or Inner City is divided into three portions; and at the heart of it are two enclosures, into the innermost of which entrance is forbidden to all except such as have official claims to admission. It is called the "Purple Forbidden City," is very nearly two and one-quarter miles in circuit, and in it are the palaces of the former emperors and other members of the imperial family.

The T'âi Ho, or "Hall of Grand Harmony," is built of marble on a terrace twenty feet high, and rising itself an additional one hundred and ten feet; its principal apartment is two hundred feet long and ninety feet wide. Surrounding the Forbidden City is the "August City," about six miles in circuit, and encompassed by a wall twenty feet high. In the western part of the "August City" is the "Western Park" with a large artificial lake, a summer-house, gardens, the copper statue of Buddha (sixty feet high), and the temple of "Great Happiness."

In the General City are the principal offices of the government, the observatory, the Provincial Hall for literary examinations, the Colonial Office, and the "National Academy." In the northeastern corner is the Russian mission, and west from it the "Palace of Everlasting Harmony," a grand monastery for over a thousand Mongol and Tibetan monks. A little farther west stands, amidst cypresses, the temple of Confucius. To the "Temple of Emperors and Kings," near the south wall, the emperors went to worship the spirits of nearly two hundred predecessors. The great Tutelary Temple of the capital is grimy, and full of fortune-tellers. All the foreign legations and Christian missions are within the Inner City. The new Roman Catholic Cathedral is conspicuous.

The Chinese or Outer City is very sparsely populated; much of the ground is under cultivation or wooded.

The "Altar to Heaven," with its adjunct, the "Altar of Prayer for Grain," and the "Altar of Agriculture," are both near the southern wall. The "Altar to Heaven" stands on a splendid triple circular terrace of white marble, richly carved, in a grove of fine trees. The "Altar of Prayer for Grain," was burned down in 1889.

The principal streets of the Chinese City are more than one hundred feet wide, but the side streets are mere lanes. The streets are seldom paved and are deep either in mud or in dust. In the smaller streets the houses are miserable shanties; in the main streets both private houses and shops are one-story brick edifices, the shops gay with paint and gilding.

There are three Catholic cemeteries (Portuguese, French, and native) and a Russian one; and there are mission buildings, Russian and others, and hospitals.

History.—Chinese historical documents begin with the reigns of Yâo and Shun. In 403 B. C. we find only seven great states, all sooner or later claiming to be "the kingdom," and contending for the supremacy, till Ts'in (Ch'in) put down all the others, and in 221 B. C. its king assumed the title of Hwang Tî, or emperor. From that year dates the imperial form of the Chinese government, which thus existed for more than two thousand one hundred years.

The changes of dynasty were many, two or more sometimes ruling together, each having but a nominal supremacy over the whole nation. The greater dynasties have been those of Han (206 B. C.-220 A. D.), T'ang (618-906), Sung (960-1279), Yüan (the Mongol, 1280-1367), the Ming (1368-1643), and the Ch'ing (Manchû-Tartar, from the Manchû conquest of China in 1643 to the 1912 revolution).

It was not till after the Cape of Good Hope had been doubled, and the passage to India discovered by Vasco da Gama in 1497, that intercourse between any of the European nations and China was possible by sea. It was in 1516 that the Portuguese first made their appearance at Canton; and they were followed at intervals of time by the Spaniards, the Dutch, and the English in 1635. The Chinese received none of them cordially; and Chinese dislike of them was increased by their mutual jealousies and collisions with one another. In the meantime trade gradually increased, and there grew up the importation of opium from India. From the measures of the Chinese to prevent the import of opium came the first English war with China in 1840; the result of which was the opening of Canton, Amoy, Fûchâu, Ningpo, and Shanghâi to commerce, and the cession of Hongkong to Great Britain. A second war, in 1857, France being allied with Great Britain, ended in the opening of five more treaty ports. A third war (1860) and the march on Peking did even more to open China to the world.

After a war in 1884-1885 France secured permanent control of Tongking and Annam.

In 1894 Japan, reviving old claims on Korea, drove the Chinese out of Korea, and after victories on land and at sea, captured Port Arthur and Wei-hai-wei. By the treaty of 1894 Japan secured as indemnity Formosa and the Liao-tung peninsula; but the protests of Russia, Germany, and France made Japan resign Liao-tung. Russia obtained a lease of Port Arthur and Talienwan, with railway and other privileges in Manchuria; Germany obtained Kiao-chau and concessions in Shantung; and Great Britain, as an offset, obtained a lease of Wei-hai-wei and sought to secure trading freedom in the Yang-tze-kiang valley.

Russia's refusal to evacuate Manchuria and her movements in Korea led to war with Japan in 1903, the defeat of the Russian armies in Manchuria, the destruction of the Russian fleet, and the fall of Port Arthur (1905), China being nominally neutral. By the peace (1905) Japan secured dominance in Korea, the Russian leases in Liao-tung, and great influence in southern Manchuria and on China generally.

A series of far-reaching reforms, promoted by a nationalist reform party in 1898, were summarily cancelled by the dowager empress, who assumed supreme authority. The reactionary and anti-foreign "Boxer" association ("The Fist of Righteous Harmony"), encouraged by the court, made extermination of foreigners its war cry in that year, and besieged the legislations in Peking. After a two months' siege by an army of Japanese, Russians, British, Americans, French, and Germans this condition was relieved. The constitutional movement began in 1911, followed by a revolution. The leader of the revolt at Han-kau was the able general, Li Yuan-hung, but the inspirer of the revolution was Dr. Sun Yat-sen, at that moment in America.

On October 13 the rebels proclaimed a republic in the province of Hu-peh, with Li Yuan-hung as president, and notified the foreign consuls that the property and persons of foreigners would be respected.

On February 12, 1912, the throne issued three edicts, in which it announced its will to abide by the decision of the National Convention and accept the republic, entrusting Yuan with the task of bringing about the new constitution in conjunction with the Nan-king government, and, after exhorting all to peacefully accept the new order, announced the abdication of the dynasty.

A constitution of seventy clauses was promulgated; the emperor was to retain his title and receive a pension, and be accorded the civility due to a foreign sovereign. On February 27 the Nan-king Assembly endorsed this decision by electing Yuan president, and he was formally installed on March 10.

Yuan's administration was hampered by the movements in Mongolia and Tibet towards autonomy, movements countenanced by Russia and Great Britain respectively. Difficulties were also put in the way of China by the European powers in the matter of a development loan, but President Yuan, supported by Dr. Sun Yat-sen, seems to have laid securely the foundations of the largest republic the world has yet seen.

President Yuan Shi-ki was assassinated in 1916, and succeeded by Li Yuan-hung.

INDIA, the Indian Empire of the British crown, is an extensive region of southern Asia, and next after China the most populous area in the world. It occupies the central peninsula of southern Asia, and has a length of some nineteen hundred miles, a breadth of sixteen hundred, and an area, inclusive of Burma, of 1,766,650 square miles. The natural boundaries of this vast region are, on the north, the range of the Himalaya Mountains, which separates it from Tartary, China, and Tibet; on the west, the mountainous frontiers of Afghanistan and, farther south, of Persia; on the southwest and south the Arabian Sea and the Indian Ocean; on the east the hill ranges which border upon Burma and the Bay of Bengal.

Surface.—The region presents a diversified surface and scenery. It has indeed been called "an epitome of the whole earth," consisting as it does of mountains far above the level of perpetual snow, broad and fertile plains bathed in intense sunshine, arid wastes, and impenetrable forests.

The most prominent feature in the relief of India is the great range of snowy peaks named the *Himalaya*, or "abode of snow," which rises on the edge of the Tibetan plateau, above the northern plains, stretching out in a continuous chain for nearly eighteen hundred miles. The mean height of this portion of the borders of the Tibetan plateau, defined very clearly by the channels of the Indus and the Bramaputra, is estimated at thirteen thousand feet; the mean breadth of its base is about one hundred and fifty miles. Its summits rise to twenty-nine thousand feet, and most of the difficult passes ascending from the valleys and gorges of the Indian side are not lower than about sixteen thousand feet.

Southward from the bases of the Himalaya and the Sulaiman mountains the great plain of northern India spreads out, reaching across the whole breadth of Hindustan from the Arabian Sea to the Gulf of Bengal.

Southward of the great plain the land begins to rise again. The first elevations reached in this direction are those of the long range of the Aravali hills, which extend for four hundred miles from northeast to southwest, marking the edge of the western section of the great plain. It is bold and precipitous on that side which falls toward the Indian desert, but less so on the southeast; its average height is about three thousand feet, Mount Abu, being the highest point.

Behind the Aravali hills lie the plateaus of Malwa and Bundelkhand, extending over the country generally termed central India; These are fertile tablelands of uneven surface elevated from one thousand five hundred to two thousand feet above the sea level, and traversed by a number of minor hill ridges.

The greater part of south India is occupied by the wide tableland of the Deccan. The name *ghat* was originally applied by the natives to the passes in the outer slopes of the ranges which run parallel with the two coasts of the southern portion of the great promontory of India enclosing the Deccan, and which had to be ascended to reach the high interior country from the coast; but this name Ghat has been transferred to these ranges or outer edges of the tableland themselves.

The western Ghats, about eight hundred miles in length, clothed with magnificent teak forests, form by far the boldest and most continuous escarpment of the Deccan plateau, ascending abruptly from a low base, generally at a distance of about thirty miles from the sea.

The eastern Ghats differ from the western in being much lower, in rising at a much greater distance from the coast of the Bay of Bengal, and with a gentle slope, giving access by wide openings to the interior. Their average height is about fifteen hundred feet, the highest point, near Madras, only about three thousand feet above the sea. The Deccan plateau between these supporting buttresses has thus a gradual eastward slope, and is characterized by undulating treeless plains, ridges and isolated flat-topped hills capped with basalt. Large portions of it are also covered with jungle, often overgrowing the ruins of former towns and temples, but there is no extent of forest.

Between the eastern Ghats and the sea lies the extensive maritime plain generally named the Karnatic, reaching back from the Coromandel coast for about fifty miles. The soil of this plain proves abundantly fertile when it is watered, but there are few streams, and a supply of water for irrigation has to be stored in reservoirs.

Rivers.—The river system of India consists of three great rivers: the Indus, the Ganges, the Bramaputra.

The Indus rises on the northern slopes of the Himalayas, sweeps round and enters at the western extremity of the range, and waters the Punjab.

The Ganges is formed by the amalgamation of the streams which drain the southernmost slopes of the Himalayas.

The Bramaputra rises also within easy distance of the Indus in the northern slopes of the Himalayas, flows east for some considerable distance, and then enters India at the extreme eastern point of the Himalayas. It is therefore to be noticed that the river system, of such vast importance to the people of India, is the drainage of both the northern and the southern slopes of the Himalayas.

The Ganges is the sacred river of the Hindus, rises in a snow-field of the southern face of the Himalayas at an elevation of nearly fourteen thousand feet above the sea, rushing down as a torrent to the highest accessible point on its banks (ten thousand three hundred feet), where the temple of Gangotri is built. To the Hindu a bath or a drink of the sacred water at this point has wonderful atoning virtues, and those who cannot themselves make the pilgrimage hither are supplied with flasks of the holy element bottled by the priests of Gangotri. At Allahabad the Jumna, which has followed a parallel course from the mountains, adds its strength; thence, by Benares and Patna, it passes eastward to weave its many mouths with those of the Bramaputra, and to wage a battle twice daily with the inflowing tide among the malarious islands of the Sundarbans. One of the westerly delta branches, the Hugli, on which Calcutta stands, is the most frequented highway to the sea.

Climate.—The whole country has three well-marked seasons—the cool, the hot, and the rainy. The cool months are November, December, January, and a part of February; the dry hot weather precedes, and the moist hot weather follows the periodical rains. The rainy season falls in the middle of summer and is called monsoon. It is the occasional failure of the monsoons that causes the periodical famines to which the country is liable.

The central tableland is cool, comparatively, but the alternations of heat and cold differ greatly elsewhere.

In the northwest there is burning heat with hot winds in summer, and frost at night in winter.

In the south the heat is more tempered, but the winter is cool only, and not cold.

The fall of rain varies greatly in different parts of the country. In the northeastern and other outlying parts it exceeds seventy-five inches. In the Deccan, in the upper basins of the Ganges and the Indus, it is thirty, and in the lower regions of the Indus less than fifteen inches. The remainder of India is placed between the extremes represented by these damp and dry belts.

Production and Industry.—The large majority of the population of India are engaged in agricultural pursuits, nearly 200,000,000 being either engaged in tilling the soil or dependent upon those so engaged. Great irrigation works have been carried out, the area irrigated being 42,486,724 acres.

The principal crops cultivated are rice, wheat, millet, pulse, and other food grains, oil-seeds, tea, cotton, sugar-cane, tobacco, and indigo.

Tea is grown largely under European supervision in the Eastern Himalayas, and already surpasses the China teas. Coffee is grown in the south, but with checkered success. Among the dyes, indigo and lac (red) are noteworthy. The indigenous flowers are not rich, the water lilies being the best; the flowering shrubs are very fine.

Of trees in the plains near the coasts the palm order with its several varieties strikes the observer. Inland the mango fruit-tree and the orange, the umbrageous banyan, the sacred peepul, and the bamboo are features in the landscape. In the hills the teak and other useful timber trees are obtained. In the Himalayas are the cedar, the pine, the fir, the juniper.

The cultivation of opium is a government monopoly and heavy duties are levied on the exports of opium, a duty being also paid to the Indian treasury.

Almost all the metals and minerals are represented in India, but of the useful metals, excepting iron, the quantity is not known to be large. Coal exists in many parts, especially in the northeast—at Bardwan, near Calcutta, and in Assam. Gold is found in Mysore, and in the sands of many streams; copper near Delhi and elsewhere; salt is obtained in large quantity from the mines in the northwest of the Punjab, and by evaporation from the coast lagoons all round India, and from salt lakes in Rajputana. Most of the precious gems, including diamonds, rubies, sapphires, and emeralds, are found, some abundantly, some rarely, though the supply of the once famous diamonds of Golconda seems to have ceased.

Metal and textile workers, glass and pottery workers, with their dependants, number close on twenty millions, and there are large numbers employed in service.

The textile manufactures of India were famous in long past centuries thoughout the civilized world; such were the gold brocades of Delhi, brought thence to imperial Rome, the muslins of Dacca, made for the Mongol court, and the pattern colored cloths of Calicut (calico), the shawls of Kashmir, and the silks and carpets of Multan. All these home-made fabrics, however, have declined before the products of the great factories.

Peoples.—The broad division of the peoples of India includes a northern group of Aryan nations, occupying the great plains and the northern seaboard on each side, and the non-Aryan inhabitants of the Deccan plateau in southern India. This division also corresponds to that of the languages of India, separating those related to the Sanscrit, the language of the Aryan conquerors of the north, from the Dravidian and Kolarian of the south. (See Book of Races.)

LANGUAGES.—Though nearly a hundred and fifty languages, derived from nearly twenty linguistic families, are spoken in India, three of those families—the Aryo-Indian, the Dravidian, and the Tibeto-Burman—represent the speech of ninety-seven per cent of the inhabitants.

Hindustani, a dialect of Hindi, has become the literary language of Hindustan, and is the *lingua franca* of India. English is understood by many.

RELIGIONS.—The chief religions are Hinduism (218,000,000 in 1911), Mohammedans (66,000,000), Buddhists (11,000,000), Animists (10,000,000), and Christians (4,000,000).

Government.—India is a dependency of Great Britain, consisting partly of territory under the direct administration of British officials, and partly of native states, all subordinate, in varying degrees of relationship, to British authority.

The nine great provinces are Madras, Bombay, Bengal, the United Provinces of Agra and Oudh, the Punjab, Burma, Eastern Bengal and Assam, the Central Provinces, and the Northwestern Frontier Province.

In accordance with the Royal Titles Act of 1876 the King of Great Britain and Ireland assumes the additional title of Emperor of India. The Parliament of the United Kingdom is supreme over India; but all the statutes relating to India are in the nature of either constitutional enactments or financial provisions.

In India the supreme authority, both executive and legislative, is vested in the governor-general in council. The governor-general, or viceroy, who generally holds office for five years, receives a salary of eighty-five thousand dollars a year, and has power to overrule his council in cases of emergency. The council is composed of six ordinary members, all appointed, like the governor-general himself, by the crown for a period of five years. Since 1909 one of the members has been a native of India.

The work of the council is distributed among the departments of finance, commerce, home and foreign affairs, revenue and agriculture, army, legislation, education, and public works. The foreign department is under the special care of the viceroy.

The seat of the supreme government of India is Delhi, with an annual migration to the hill-station of Simla for the hot season.

Cities.—The capital, Delhi, has a population (1911) of 391,828. The other chief cities are: Calcutta (1,216,514), Bombay (972,930), Madras (517,335), Hyberabad (499,840), Rangoon (293,316), Lucknow (260,621), Lahore (228,318), Ahmedabad (215,448), Benares (204,222). In addition there are twenty cities with populations exceeding 100,000.

Delhi (*Del'lee*), since 1912 the capital of the Indian Empire is located on the right bank of the Jumna, nine hundred and fifty-four miles northwest of Calcutta. It was the capital of the Afghan or Pathan, and afterwards of the Mogul, empire. It is the terminus of the East Indian and Rajputana railways, the former crossing the Jumna by a fine iron bridge.

Delhi is walled on three sides, has ten gates, and stands on high ground, the famous palace of Shah Jehan, now the fort, looking out over the river and a wide stretch of wooded and cultivated country. To the north, about a mile distant, rises the historic "ridge," crowned with memorials of the Indian mutiny, and commanding a fine view of the city, the domes and minarets of which overtop the encircling groves.

The palace buildings comprise the cathedral-like entrance hall, the audience hall, and several lesser pavilions, covering in all an area of one thousand six hundred feet by three thousand two hundred feet, exclusive of gateways. The beautiful inlaid work and carving of these buildings are the admiration of the world, and is worthy of its famous inscription: "If there is a heaven on earth, it is this—it is this!"

In the heart of the city stands the Jama Masjid ("great mosque"), one of the largest and finest structures of the kind in India, which also owes its origin to Shah Jehan. Among the notable monuments in the neighborhood are the imperial tombs, including that of Hamayun, second of the Mogul dynasty; the old Kala Masjid, or black mosque; and the thirteenth century Kutab Minar, ten miles to the south, which is two hundred and thirty-eight feet high, and tapers gracefully from a diameter of forty-seven feet at the base to nine feet at the summit.

Modern Delhi is noted for its broad main streets, the chief being the Chandni Chauk, or Silver Street, with its high clock tower, and the institute and museum.

Delhi has a large trade in wheat and other produce, and its bazaars are noted for gold and silver work, precious stones, shawls, and costly fabrics.

Simla, since 1864 the summer headquarters of the British government in India, stands on the slopes (seven thousand feet) of the Himalayas, in a beautiful situation, one hundred and seventy miles north of Delhi. Its first house was built in 1819, and it was first visited officially by the Indian government in 1827. There are two vice-regal residences, handsome government buildings, and a fine town hall Population sixteen thousand in winter, and considerably more in summer.

Calcutta, on the left bank of the Hughly, the largest and westernmost branch of the Ganges delta, is about eighty miles from the sea. The government buildings, Bishop's College (now an engineering school), High Court, town hall, bank, museum, university, St. Paul's cathedral, and many other English buildings have earned for it the name "City of Palaces." The native quarters, though improved, are still squalid, the houses of mud or bamboo. An esplanade, numerous quays, an excellent water-supply, gas, and tramway services, add to the amenities. There are extensive dockyards, warehouses, ironworks, timber yards, and jute mills. Extensive railway and steamboat communications make it the chief emporium of commerce in Asia.

Bombay stands on an island, connected with the coast by a causeway, and has a magnificent harbor and noble docks. It is rapidly surpassing Calcutta in trade, and is one of the greatest of seaports; its position promises to make it the most important commercial center in the East, as it already is in the cotton trade of the world. It swarms with people of every clime, and its merchandise is mainly in the hands of the Parsees, the descendants of the ancient fire worshippers. It is the most English town in India. It came to England from Portugal as dowry with Catherine of Braganza, wife of Charles II., who leased it to the East India Company for fifty dollars a year. Its prosperity began when the Civil war in the United States afforded it an opening for its cotton.

Benares, the most sacred city of the Hindus, and an important town in the Northwest Provinces, is on the Ganges, four hundred and twenty miles by rail northwest of Calcutta. It presents the amazing array of one thousand seven hundred temples and mosques with towers and domes and minarets innumerable. The bank of the river is laid with continuous flights of steps whence the pilgrims bathe; but the city itself is narrow, crooked, crowded, and dirty. Many thousands of pilgrims visit it annually. It is a seat of Hindu learning; there is also a government college. The river is spanned here by a magnificent railway bridge. There is a large trade in country produce, English goods, jewlery, and gems; while its brass work "Benares ware," is famous.

Agra, a city in the United Provinces of Agra and Oudh, is on the Jumna, one hundred and thirty-nine miles southeast of Delhi by rail, and eight hundred and forty-one miles northwest of Calcutta. The ancient walls embrace an area of eleven square miles, of which about one-half is now occupied. The houses are mostly built of red sandstone, and, on the whole, Agra is the handsomest city in upper India.

Some of the public buildings, monuments of the house of Timur, are on a scale of striking magnificence. Among these are the fortress built by Akbar, within the walls of which are the palace and audience hall of Shah Jehan, the Moti Masjid or Pearl Mosque, and the Jama Masjid or Great Mosque.

Still more celebrated is the white marble Taj Mahal, situated without the city, about a mile to the east of the fort. This extraordinary and beautiful mausoleum was built by the Emperor Shah Jehan for himself and his favorite wife, who died in 1629, and is remarkable alike for the complexity and grace of the general design, and the elaborate perfection of the workmanship. In the center, on a raised platform, is the mausoleum, surmounted by a beautiful dome, with smaller domes at each corner, and four graceful minarets (one hundred and thirty-three feet high). Of British edifices the principal are the Government House, the Government College, three missionary colleges, the English church, and the barracks.

The climate, during the hot and rainy seasons (April to September), is very trying; but the average health of the city is equal to that of any other station in the United Provinces.

The principal articles of trade are cotton, tobacco, salt, grain, and sugar. There are manufactories of shoes, pipe stems, and gold lace, and of inlaid mosaic work, for which Agra is famous.

History.—It is impossible to speak positively as to the aboriginal prehistoric populations of India; probably the most primitive peoples now left—the Dravidian hill-tribes—represent waves of invasion from the north. The history of civilization in India may, however, be traced from the invasion—probably one thousand years or more B. C.—of the Aryan race from central Asia, a race of the Indo-Germanic type in physique and speech. Their language was Sanskrit, their religion and civilization that of the Vedas, or ancient Hindu scriptures.

Out of the union of the Aryans with the earlier inhabitants the modern races of India have sprung. Buddhism arose in India with the teaching of Budda about 500 B. C., and for a while superseded the Vedic faith, corrupted as it had been by the degraded aboriginal superstitions; and India was substantially Buddhist till the revival of Hinduism, in its modern or Brahmanic form (more idolatrous and superstitious than the ancient faith), in the sixth century A. D.

In 1001 A. D. came the first wave of Mohammedanism, and soon all India fell under Mohammedan domination, though the bulk of the people clung to the Hindu religion. By the beginning of the eighteenth century a new Hindu power, that of the Mahrattas, arose, and seriously weakened the Moslem emperor, the Grand Mogul. The Dutch, Portuguese, and French, as well as the British, established themselves in the empire; in the eighteenth century the French more than rivaled the British in power. But the power of the British East India Company, originally traders, became dominant after the battle of Plassey in 1757.

Gradually English power as represented by the company, its diplomatists, and its soldiers, extended over a great part of India, and the governors—Clive, Warren Hastings, Wellesley, Amherst, Bentinck, Dalhousie, Canning—consolidated what was really the empire of Great Britain in the East. Then in 1857 came the great mutiny, stamped out in blood, and the government was assumed by the British crown in 1858. British rule in India has been steadily consolidated, but no great annexation has since taken place, except that of Upper Burma in 1886.

After the mutiny, India settled down to a period of peace, broken only by the constant suspicion of Russian intrigue in Afghanstan. This led in 1878 to the second Afghan war. The Amir was deposed, and his successor promised to receive a British resident, who was in a short time murdered, as was also his escort. This resulted in the famous march of General Roberts from Kabul to Kandahar, and eventually an Amir who was favorable to the British was set up. This Amir reigned until 1901, and his successor remained friendly to the British.

Finally, in 1907, a convention between Russia and Britain was signed, and later an agreement as to the line of delimitation of their respective spheres of influence in Persia was arrived at in 1912. Quetta and the southeastern districts of Afghanistan were annexed after the second Afghan war, and the purchase of the Suez Canal was of great use in the defense of India. British supremacy over the Afghan tribes was also recognized.

After his coronation in 1911, George V. of Great Britain visited India and held a Coronation Durbar at the beginning of 1912 in India itself, this being the first visit of an English raj to the Indian empire, and the capital of India was officially proclaimed as Delhi.

JAPAN, an island empire off the east coast of Asia, separated from Siberia by the Sea of Japan. The name Japan is a corruption of *Zipangu*, itself a corruption of the Chinese pronunciation of the native name *Nihon* or *Nippon* ("Land of the Rising Sun").

Japan comprises four large islands, Honshu (the Japanese mainland), Shikoku, Kiushu, and Yezo or Hakkaido; the Luchu Islands, Formosa, divided from China by the Formosa Channel; and Korea (annexed in 1910 and renamed Chosen). A small group of islands, Bonia, six hundred miles southeast of Tokio, also belongs to Japan.

The Kwantung province, including Port Arthur and Darien, was leased to Japan by Russia (with the consent of China) in 1905, while the southern portion of Sakhalin (ceded to Russia in 1875) became once more Japanese.

The empire includes also nearly four thousand small islands.

The islands comprising the Japanese Empire have been likened to the British Isles in their position relative to the Continent, the Sea of Japan and the Strait of Korea resembling the North Sea and Strait of Dover. In their general extent of surface the comparison also holds good. The three contiguous islands of Japan proper are, however, considerably larger than Great Britain, while the northern pos-

session of Yezo is three thousand square miles larger than Ireland.

The empire with its dependencies comprises an area of 235,886 square miles, with a population of 67,142,798.

Surface Characteristics.—The islands are eminently volcanic, and eighteen of the summits are still active; the chief of these, Fuji-san, or Fuji-yama, the loftiest and most sacred mountain of Japan, about sixty miles from Tokio, has been dormant since 1707. Japan is also liable to frequent, and occasionally disastrous, earthquakes.

The country is very mountainous, and not more than one-sixth of its area is available for cultivation. The numerous ranges extend in directions parallel to the length of the group, giving varied and picturesque landscapes of hill and valley. Their irregular coast-line is indented with splendid natural harbors, such as the Bay of Yedo on the southeast coast; the beautiful "inland sea" of Japan, with its intricate channel between hundreds of islets, separates the island of Shikoku from the larger one of Hondo, and the enclosed Suwonada and Bugo Channel, divide the southwestern island of Kiushu from both of these.

Lakes and Rivers.—From the mountainous character of the long narrow islands the rivers are generally impetuous, and of small economic importance, except for irrigation. Among the most important may be noted the Yodogawa, which flows from the fiddle-shaped Lake Biwa, the largest fresh water expanse in Japan, thirty-five miles long, to the "inland sea;" the broad and rapid Ten-riu-gawa, or "River of the Heavenly Dragon," which flows south from the central mountains of Nippon; and the Tonegawa, which enters the Pacific, but sends a branch to the Bay of Yedo, which is crossed within the capital by the Nippon Bassi, or bridge of Japan, from which, as a starting point, all distances throughout the kingdom are measured.

Climate.—The islands of Japan have a climate that may be compared with that of South Britain. The extremes, however, are greater, summer being hotter, and winter colder, than in England, increasing to almost Siberian rigor in the north. June, July, and August form the Satkasi, or rainiest period; the autumn succeeding is the pleasantest and most genial season of the year. Hurricanes, storms, and fogs, are frequent in the seas round Japan, where warm and cold ocean currents also bring about great differences of sea temperature.

Products and Industries.—The islands have a very beautiful flora, including many ornamental plants. The great feature of the vegetation is the intermixture of tropical growths, such as the bamboo, palms, tree-ferns, and bananas, with those of temperate regions, the pine, oak, beech, chestnut and maple. Characteristic are the paper mulberry, the vegetable-wax tree, the camphor and lacquer trees. The cultivated crops are rice, maize, wheat, barley, tobacco, tea, and cotton.

Japan is also very rich in minerals. Gold, silver, and copper are especially abundant in the north, and coal and iron beds seem to extend throughout the group. Petroleum is also being produced in large quantities, especially in the Province of Echigo.

People.—With the exception of the wilds of Yezo, peopled by eighteen thousand Ainos, the Japanese islands are inhabited by a single race speaking various dialects of the same tongue. Probably the Japanese are the issue of the intermarriage of victorious Tartar settlers, who entered Japan from the Korean peninsula, with Malays in the south and Ainos in the main island. See Book of Races.

There are two prevailing religions in Japan—Shintoism, the indigenous faith; and Buddhism, introduced from China in 552 and still the dominant religion among the people. Francis Xavier introduced Christianity in 1549, and the Roman Catholic Church and the Greek Church both carry on a flourishing work in Japan. Of the Protestant missions there are also many actively at work.

In education, as well as in matters of religion, enormous changes and advances have have been made in recent years. Education is in the lower grades free and compulsory. Secondary schools are state aided, and prepare for a three years' course at the universities, which is largely devoted to the study of European languages. There are high schools for girls, and the technical and special schools are well attended. There are three State Universities, at Tokio, Kyoto, and Tohoku.

Production and Industry.—Agriculture is the chief occupation of the Japanese, and they are excellent and careful farmers. In the mechanical arts also they excel; especially in the use of metals, in the manufacture of porcelain and glass lacquered wares, and silk fabrics. The chief manufactures are silk and cotton, cotton yarn, matches, paper, glass, lacquer ware, porcelain, and bronze, and ship building is an important industry in the yards.

The chief exports are silk, cotton, yarns, rice, tea, fish, copper, matches, coal, camphor, straw plaits, porcelain, earthenware, lacquerware, and marine products.

The commercial development of Japan has of late been marvelous. There were five thousand nine hundred and eighty-five miles of railroad open in 1914, in addition to eight hundred and thirty-six miles open in Korea, while the South Manchurian Railway (China) is under Japanese control.

Government and Administration.—The government is an hereditary monarchy, the succession being now exclusively in the male line. The Cabinet consists of ten Ministers of State, presided over by a Minister President.

The Upper House, or House of Peers, consists of about three hundred and thirty members—male members of the royal house, life peers, peers elected either for life or for seven years, and other persons nominated by the emperor. The lower house, or House of Representatives, has three hundred and sixty-nine members, who serve for four years, elected by citizens paying taxes of not less than ten yen (five dollars) per annum. The first general election took place in 1890.

Penal and civil codes have been drafted on a European basis, and with a commercial code were published in 1890, and came into force in 1893.

Cities.—The capital of the Japanese Empire, Tôkiô, formerly called Yedo, is the residence of the emperor; population, 2,186,079. Other cities are: Osaka, 1,226,590; Kiôtø, the ancient capital, 442,462; Nagoya, 378,231; Kōbe, 378,197; Yokohama, 394,303; Hiroshima, 142,763; Nagasaki, 176,480; Kanazawa, 110,994; Kure, 100,679. The chief ports are Yokohama, Kōbe, Osaka, Nagasaki, and Hakodate.

Tokio, or Tokei ("Eastern Capital"), is the chief city of the Japanese Empire. Until 1868, when the emperor removed his court thither from Kyōtō, it was known as Yedo ("Estuary Gate"). Its position at the mouth of the rivers which drain the largest plain of Japan, fits it to be a national center. The lower portion of the city, which is flat and intersected by canals, stretches between the two parks of Ueno (north) and Shiba (south), famous for their shrines. Midway rises the castle or palace, a fine structure in Japanese style, furnished in European manner, and lighted with electricity, within a double ring of high walls and broad moats. In spring-time the city is gay with plum and cherry blossoms. The immense enclosures, formerly inhabited by the nobles and their retainers, are gradually disappearing, and handsome modern buildings in brick for the use of the various government departments are taking their place. Of the fifteen city divisions the northern, Hongo and Kanda, are mostly educational, and contain the buildings of the Imperial University, Law School and other institutions. The student population is astonishingly large. The seaward districts of Nihonbashi, Kyobashi, and Asakusa are industrial and commercial, while the government offices are located in Kojimachi ku.

Yokohama is the port of entry (seventeen miles off), and a great harbor scheme to cost twenty million dollars was planned in 1911-1912. The city is subject to disastrous fires; that of April, 1892, burned four thousand houses in one morning. Tokio has three railway termini and a system of electric railways. Almost every phase of modern civilization is to be found within its vast area.

History.—Before 500 A. D. Japanese history is mere legend. Buddhism was introduced from Korea in 552; and in the next century Chinese civilization strongly influenced Japan. About the end of the twelfth century, the weakness of the emperor led the military head (Shogun) to assume a large share of the supreme power, and he handed it on to his descendants. Hence the statement often made that Japan had a Mikado or spiritual emperor who reigned but did not govern, and a "Tycoon" (Shogun) who did govern though he paid homage to the nominal sovereign. The military caste was now dominant until the reign of Iyeyasu (c. 1600), whose descendants reigned till 1868.

Total exclusion of foreigners was the rule till 1543, when the Portuguese effected a settlement; but in 1624 all foreigners were expelled and Christianity interdicted. The policy of isolation was rigidly pursued from 1638 till 1853, when Commodore Perry of the United States Navy steamed into a Japanese harbor, and effected a treaty with the Shogun. Soon sixteen other nations followed the American example, and free ports were opened to foreign commerce.

In 1867-1868 a sharp civil war broke the feudal power of the daimios or territorial magnates, suppressed the Shogunate, and unified the authority under the Mikado. In a very few years Japanese students took a place of their own in western science; and how thoroughly the Japanese had laid to heart what they had learned abroad in the military and naval arts was partially revealed by the swift and complete success of the war with China about Korea in 1894, and more impressively by their amazing triumph over the great military empire of Russia, in 1904-1905, whom they defeated in a succession of bloody battles, took Port Arthur, and utterly destroyed the Russian fleet. By the peace that followed the Russians not only evacuated southern Manchuria, but recognized Japan's preponderance in Korea, and gave up to Japan the "leases" of Port Arthur and the Liao-tung peninsula Russia had wrested from China.

A conspiracy against the life of the emperor was discovered in September, 1910. The same year saw the passing of a bill enabling foreigners to own land in Japan proper, under certain restrictions. But the principal event of 1910 in Japanese history was the formal annexation of Korea, the treaty with the emperor of Korea being promulgated on August 29. According to the new commercial treaty with the United States, ratified by the Senate on February 24, 1911, the clause in the old treaty was omitted, wherein each side reserved the right of regulating immigration from one country to the other. In 1910 and 1911 important agreements were also made with Russia with special reference to Manchuria.

Japan entered the European war on August 23, 1914, on the side of the Entente Allies, and immediately began the blockade and siege of the German colony at Kiao-Chow on the Shantung promontory of China. In November, 1915, the present emperor, Yoshihito, was crowned.

THE COLONIAL DIVISIONS OF THE WORLD

The following tables show how the colonies of the world have been divided among the various nations:

COLONIES IN AFRICA

Colony	Governing Country and Form of Government	Area Sq. M.	Population
Algeria	French Colony	184,474	4,739,300
Algerian Sahara	French Possession	123,500	50,000
Angola	Portuguese Possession	484,800	4,119,000
Ascension	British Crown Colony	35	430
Azores and Madeira Islands	Portuguese Province	1,510	407,002
Basutoland	British Crown Colony	10,293	264,100
Bechuanaland	British Protectorate	286,200	100,500
British East Africa	British Protectorate	1,000,000	2,500,000
British Central Africa	British Protectorate	42,217	900,615
British South Africa (Rhodesia)	British Protectorate	425,728	1,075,000
Canary Islands	Spanish Province	2,808	334,521
Cape Colony	British Protectorate	276,775	2,433,000
Cape Verde Islands	Portuguese Province	1,480	147,424
Ceuta	Spanish Province	13	5,090
Comoro Islands	French Protectorate	620	47,000
Congo Inland Straits	Belgian Protectorate	900,000	30,000,000
Dahomey	French Possession	60,000	1,000,000
Egypt	Turkish Tributary	400,000	9,734,405
Eritrea, etc.	Italian Possession	42,000	329,516
Fernando Po, etc.	Spanish Possession	850	23,709
French Congo	French Possession	1,160,000	10,000,000
Gambia	British Crown Colony	69	13,500
German East Africa	Under League of Nations	384,180	8,000,000
German Southwest Africa	Under League of Nations	322,450	200,000
Gold Coast	British Crown Colony	40,000	1,500,000
Guinea, French	French Possession	95,000	2,200,000
Guinea, Portuguese	Portuguese Possession	4,440	820,000
Ivory Coast	French Possession	116,000	2,000,000
Kamerun	Under League of Nations	191,130	3,500,000
Lagos	British Crown Colony	3,460	85,600
Madagascar	French Possession	227,950	2,505,240
Mauritius, etc.	British Crown Colony	729	378,040
Mayotte	French Possession	140	11,640
Military Ter's	French Possession	700,000	4,000,000
Portuguese East Africa	Portuguese Possession	301,000	3,120,000
Natal and Zululand	British Institutions	34,019	902,365
Nigeria	British Protectorate	400,000	25,000,000
Nossi-Be	French Possession	130	9,500
Orange River	British Possession	48,330	207,500
Princes and St. Thomas Islands	Portuguese Possession	360	42,103
Reunion	French Possession	966	173,200
Rio de Oro and Adrar	Spanish Possession	243,000	100,000
Sahara	French Possession	1,544,000	2,550,000
St. Helena	British Crown Colony	47	3,342
St. Marie	French Possession	64	7,670
Senegal	French Possession	80,000	1,800,000
Seychelles	British Crown Colony	148	19,343
Sierra Leone	British Crown Colony	4,000	77,000
Somali Coast, British	British Protectorate	75,000	.....
Somali Coast, French	French Possession	45,000	200,000
Somali Coast, Italian	Italian Possession	100,000	400,000
Togoland	Under League of Nations	33,700	900,000
Transvaal Colony	British Possession	119,140	1,094,100
Tripoli	Turkish Tributary	398,000	800,000
Tristanda Cuhna	British Crown Colony	45	100
Tunis	French Protectorate	51,000	1,900,000
Uganda	British Protectorate	140,000	3,000,000
Zanzibar and Pemba	British Protectorate	1,020	200,000

COLONIES IN ASIA

Colony	Governing Country and Form of Government	Area Sq. M.	Population
Aden and Perim	British Crown Colony	80	41,222
Anam	French Protectorate	52,100	6,124,000
Bahrein Islands	British Protectorate	273	68,000
Baluchistan	British Protectorate	130,000	500,000
Bokhara	Russian Dependency	92,000	1,250,000
Cambodia	French Protectorate	37,400	1,500,000

THE COLONIAL DIVISIONS OF THE WORLD—Continued

COLONIES IN ASIA—Continued

Colony	Governing Country and Form of Government	Area Sq. M.	Population
Ceylon	British Institutions	25,365	3,578,333
Cochin China	French Possession	22,000	2,968,600
Cypress	British Administration	3,584	227,900
East Turkestan	Chinese Dependency	550,340	1,200,000
Formosa	Japanese Dependency	13,455	2,745,000
Goa	Portuguese Possession	1,390	494,836
Hong Kong	British Crown Colony	407	386,159
India, British	British Crown Colony	1,087,404	231,898,807
India, French	French Possession	196	273,000
India, Portuguese	Portuguese Possession	1,558	572,290
Jungaria	Chinese Dependency	147,950	600,000
Kiauchau Bay	Japanese Possession	200	60,000
Khiva	Russian Possession	22,320	800,000
Kwang Tung	Russian Possession	.....	.....
Macao	Portuguese Possession	4	78,627
Malay Federated States	British Protectorate	27,500	512,342
Manchuria	Chinese Dependency	363,610	8,500,000
Mongolia	Chinese Dependency	1,367,600	2,580,000
Pescadores Islands	Japanese Dependency	85	52,400
Samos	Turkish Tributary	180	54,830
Sikkim	British Protectorate	2,818	30,458
Straits Settlements	British Crown Colony	1,472	572,249
Tibet	Chinese Dependency	463,200	6,430,000
Tonquin and Laos	French Possession	144,400	7,641,900

COLONIES IN EUROPE

Colony	Governing Country and Form of Government	Area Sq. M.	Population
Bosnia and Herzegovina	Jugo-Slavia	23,262	1,568,092
Crete	Greece	3,326	303,543
Faroe Islands	Danish Colony	512	15,230
Gibraltar	British Crown Colony	2	27,460
Iceland	Danish Province	39,756	78,470
Malta and Gozo	British Institutions	117	188,141

COLONIES IN NORTH AMERICA

Colony	Governing Country and Form of Government	Area Sq. M.	Population
Alaska	United States Territory	599,446	63,592
Bahamas	British Institutions	4,470	54,358
Barbadoes	British Institutions	166	195,600
Bermudas	British Institutions	20	17,535
Canada	British Dependency	3,729,665	7,204,838
Curacao, etc.	Dutch Possession	403	52,301
Danish West Indies*	United States Possession	138	32,786
Greenland	Danish Possession	46,740	10,516
Guadeloupe, etc.	French Possession	688	182,110
Honduras, British	British Crown Colony	7,560	37,650
Leeward Islands	British Institutions	700	127,440
Jamaica and Turks Islands	British Crown Colony	4,370	771,900
Martinique	French Possession	380	203,780
Newfoundland and Labrador	British Dependency	162,200	217,100
Porto Rico	United States Possession	3,606	953,243
St. Pierre and Miquelon	French Possession	92	6,250
Trinidad and Tobago	British Crown Colony	1,868	279,700
Windward Islands	British Institutions	500	162,800

COLONIES IN SOUTH AMERICA

Colony	Governing Country and Form of Government	Area Sq. M.	Population
Falkland Islands	British Crown Colony	7,500	2,076
Guiana, British	British Institutions	104,000	294,000
Guiana, French	French Colony	30,500	32,910
Guiana, Dutch	Dutch Possession	46,060	68,968

* These islands came into possession of the United States in 1917, by purchase for $25,000,000, and have been renamed the Virgin Islands.

THE COLONIAL DIVISIONS OF THE WORLD—Concluded

COLONIES IN OCEANIA

Colony	Governing Country and Form of Government	Area Sq. M.	Population
Bismarck Archipelago	Under League of Nations	20,000	188,000
Borneo, British N.	British Protectorate	31,106	175,000
Borneo, Dutch	Dutch Possession	212,737	1,180,578
Caroline Islands and Palaos	Under League of Nations	810	42,000
Celebes Islands	Dutch Possession	71,470	1,197,860
Fiji and Rotumah Islands	British Crown Colony	7,740	120,950
Guam	United States Possession	150	9,000
Hawaii	United States Territory	6,449	154,000
Java and Madura	Dutch Possession	50,554	28,745,698
Kaiser Wilhelm Land	Under League of Nations	70,000	110,000
Marianne Islands	Under League of Nations	250	2,000
Marquesas Islands	French Possession	480	4,280
Marshall Islands	Under League of Nations	150	13,000
New Caledonia	French Possession	7,650	51,415
New Guinea, British	British Crown Colony	90,540	350,000
New South Wales	British Dependency	310,370	1,397,700
New Guinea, Dutch	Dutch Possession	195,653	599,208
New Zealand	British Dependency	104,470	787,660
Philippine Islands	United States Possession	119,542	8,000,000
Queensland	British Dependency	668,500	510,520
Samoan Islands (Savaii and Upolu)	Under League of Nations	1,000	29,100
Samoan Islands (Tutuila and Manua)	United States Possession	79	5,800
Society Islands, etc.	French Possession	1,520	29,000
Solomon Islands	Under League of Nations	4,200	45,000
South Australia	British Dependency	903,700	364,800
Sumatra	Dutch Possession	161,612	3,209,067
Tasmania	British Dependency	26,215	174,230
Timor, Dutch	Dutch Possession	44,374	978,267
Timor, Portuguese	Portuguese Possession	7,458	300,000
Victoria	British Dependency	87,890	1,208,710
West Australia	British Dependency	975,920	194,800

THE GREAT FOREIGN WARS OF UNIVERSAL HISTORY

In the various wars the victorious contestants are indicated in **bold face** type, as are also the victorious leaders and the battles won by them. The figures prefixed show with which of the warring parties the leaders are identified, and who were the victors in the battles named. Naval battles are shown in *italics*. Consult the Table of Foreign Battles for details concerning the more important military actions.

TROJAN WAR (Partly mythical).—1193-1184 B. C.
(1) **Greeks** vs. (2) Trojans.
CAUSE: Greeks avenge the abduction of Helen of Troy by Paris.
LEADERS: (1) **Agamemnon, Achilles, Ulysses;** (2) Hector.
CHIEF ACTION: (1) **Siege of Troy.**
RESULTS: Capture and destruction of Troy, or Ilium.

FIRST MESSENIAN WAR.—743-724 B. C.
(1) **Spartans** vs. (2) Messenians.
CAUSE: Spartans covet Messenian land.
LEADER: (2) Aristodemus.
CHIEF ACTION: (1) **Siege of Mount Ithome.**
RESULTS: Messenians become tributary of Sparta and their land is, in part confiscated.

SECOND MESSENIAN WAR.—645-628 B. C.
(1) **Spartans** vs. (2) Messenians.
CAUSE: Spartan oppression causes Messenian revolt.
LEADERS: (1) **Tyrtaeus** (poet); (2) Aristomenes.
CHIEF ACTION: (1) **Eira.**
RESULTS: Greater part of Messenians flee to Sicily. Those remaining become helots (Spartan serfs).

FIRST SACRED WAR.—600-590 B. C.
(1) **Amphictyonic League** vs. (2) Crisæans.
CAUSE: People of the city of Crisa (port of Delphi) oppress pilgrims to the oracle.
LEADER: (1) **Cleisthenes of Sicyon.**
CHIEF ACTION: (1) **Siege of Crisa.**
RESULTS: For the first time Greek cities join in an effective league. Crisa destroyed.

PERSIAN WARS.—500-479 B. C.
(1) **Persians** vs. (2) Greeks.
CAUSE: Aid given by Athens and Eretria to revolting Ionic Greek cities, leading to burning of Sardis, 497 B. C.
a. First Persian Expedition—493 B. C.
LEADER: (1) **Mardonius.**
CHIEF ACTION: (1) **Three hundred ships lost by storm off Mt. Athos.**
RESULTS: Partial success against Macedonians and Thracians. Continued plans of Darius for subjugating Greece.
b. Second Persian Expedition—490 B. C.
LEADERS: **Datis,** (1) **Artaphernes;** (2) Miltiades.
CHIEF ACTIONS: (1) **Naxos, Eretria;** (2) Marathon (490 B. C.)
RESULTS: The Athenians are victorious and the Persians retreat to Asia Minor.
c. Third Persian Expedition—481-480 B. C.
Xerxes desires to avenge his father's defeat.
LEADERS: (1) **Xerxes;** (2) Leonidas, Eurybiades, Themistocles.
CHIEF ACTIONS: (1) **Thermopylæ,** *Salamis,* **Artemisium, Athens burned.**
RESULTS: Xerxes retreats to Persian after his defeat at Salamis.
d. Fourth Persian Expedition—479 B. C.
War continued by troops which Xerxes left behind.
LEADERS (1) **Mardonius;** (2) Pausanias, Aristides.
CHIEF ACTIONS: (1) Athens laid waste; (2) **Platæa, Mycale.**
RESULTS: All Persian invasions and attempts to subjugate Greece cease.

THIRD MESSENIAN WAR.—464-456 B. C.
(1) **Helots of Messenian descent** vs. (2) Spartans.
CAUSE: Confusion following earthquake gives Helots courage to revolt.
CHIEF ACTION: (2) Mt. Ithome besieged. Sparta sent home her Athenian allies.
RESULTS: Messenians capitulate and are allowed to leave the Peloponnesus never to return. Athens retaliates by settling them at Naupactus.

PELOPONNESIAN WAR.—431-404 B. C.
(1) **Sparta and Allies** vs. (2) Athens and Allies.
a. First Period—431-421 B. C.
CAUSE: Envy of Sparta and her allies at Athens' growing power and influence. Discontent among some of the Athenian subject states.

THE GREAT FOREIGN WARS OF UNIVERSAL HISTORY—Continued

LEADERS: (1) **Archidamus, Agis, Brasidas;** (2) Demosthenes, Cleon, Nicias.

CHIEF ACTIONS: (1) **Invasion of Attica, Plague in Attica, Siege of Platæa, Delium, Amphipolis.** (2) Mitylene, Sphacteria.

RESULTS: By the peace of Nicias (421 B. C.) both sides are to restore conquests and prisoners but terms are imperfectly carried out.

b. Second Period or Decelean War—413-404 B. C.

CAUSE: Sparta takes advantage of Athens' weakness, resulting from the failure of the expedition to Syracuse, to renew the war.

LEADERS: Alcibiades serves Athens, Sparta and Athens in turn. (1) **Lysander;** (2) Conon.

CHIEF ACTIONS: (1) **Decclea occupied. Attica ravaged. Many subject states of Athens revolt. Notium, Ægospotami, Surrender of Athens;** (2) Abydos, Cyzicus, Arginusæ.

RESULTS: The Spartans tear down the walls of Piræus and Athens. Athens loses her foreign possessions and fleet but becomes an independent ally of Sparta. Sparta is now supreme in Greece.

GAULS' INVASION OF ITALY.—390 B. C.

(1) **Gauls** vs. (2) Romans.

CAUSE: Roman people refuse to surrender Roman ambassadors who had aided the Etruscans against the Gauls.

LEADERS: (2) M. Manlius, Capitolinus, Camillus.

CHIEF ACTIONS: (1) **Battle of the Allia. Sack of Rome.**

RESULTS: Gauls retire on payment of ransom. The overthrow of Rome had no permanent effect on her fortunes.

SECOND SACRED WAR.—c. 355-346 B. C.

(1) **Phocians** vs. (2) Amphictyons.

CAUSE: Phocians seize and plunder Delphi because of fine imposed by Amphictyonic Council.

LEADERS: (1) **Onomarchus;** (2) Philip of Macedon.

RESULTS: Thebans and Thessalians invite aid of Philip against Phocians and he takes their place in the Amphictyonic Council.

THIRD SACRED WAR.—339-338 B. C.

(1) **Macedonians** vs. (2) Athenians, Thebans.

CAUSE: Amphictyons call in Philip to punish Amphissa, whereupon he seizes Elatea, thereby threatening Athens. Athenians aroused by Demosthenes.

LEADERS: (1) **Philip of Macedon.**

CHIEF ACTIONS: **Chæronea.**

RESULTS: Philip gains leadership of Greece. Henceforth Greece is under the control of Macedonia.

SAMNITE WARS.—343-290 B. C.

(1) **Romans** vs. (2) Samnites.

a. First Samnite War—343-341 B. C.

CAUSE: A duel between two rival races for supremacy in Italy. Campanians implore aid of Romans against Samnites who are laying waste their territories in revenge for aid given the Sidicini of Teanum.

LEADERS: (1) **Marcus Valerius Corvus, P. Decius Mus.**

RESULTS: Capua is retained by the Romans and Teanum surrendered to Samnites.

b. Second or Great Samnite War—326-304 B. C.

CAUSE: The occupation of Palaeopolis by the Samnites. In 311 B. C. the Etruscan cities joined in the war against Rome.

LEADERS: (1) **Papirius Cursor;** (2) Fabius Rullianus Gavius Pontius.

CHIEF ACTIONS: (1) **Fregellæ, Sutrium, Lake Vadimonis, Bovianum;** (2) Caudine Forks.

RESULTS: Samnites sue for peace. They resign all their conquests but retain their independence within their native mountains.

c. Third Samnite War—298-290 B. C.

CAUSE: While Romans are engaged with the Gauls the Samnites enter Lucania and refuse to withdraw.

LEADERS: (1) **Q. Fabius Rullianus, P. Decius Mus (son);** (2) Gellius Egnatius, Gavius Pontius.

CHIEF ACTION: (1) **Sentinum.**

RESULT: Samnites defeated but not crushed.

WARS OF ALEXANDER THE GREAT IN ASIA—334-328 B. C.

(1) **Greeks** vs. (2) Persians, Egyptians, Bactrians, Indians (Hindus).

CAUSE: A war of conquest, a scientific expedition and a journey of discovery.

LEADERS: (1) **Alexander the Great, Nearchus;** (2) Darius III., Memnon.

CHIEF ACTIONS: (1) **Granicus, Issus, Siege of Tyre, Arbela.**

RESULTS: Alexander conquers Asia from the Mediterranean Sea to the Indus River and from the Arabian Sea to the Jaxartes River and begins the Hellenizing of the East. Founds Alexandria in Egypt. The empire breaks up after Alexander's death 323 B. C.

ROMAN WAR WITH TARENTUM AND EPIRUS.—282-272 B. C.

(1) **Romans** vs. (2) Tarentum and King Pyrrhus.

CAUSE: The people of Tarentum capture Roman ships and insult Roman embassy. They call in King Pyrrhus of Epirus.

LEADERS: (1) **Manius Curius;** (2) Pyrrhus.

CHIEF ACTIONS: (1) **Beneventum, Tarentum;** (2) Heraclea, Asculum.

RESULTS: Pyrrhus returns to Epirus and his allies one by one submit to Rome, which is left supreme from Straits of Messina to the River Arno and the headland of Ancona.

FIRST PUNIC WAR.—264-241 B. C.

(1) **Romans** vs. (2) Carthaginians.

CAUSES: A struggle for supremacy in Sicily. Pretext, Campanian mercenaries, having seized Messina, appeal to Rome for aid.

LEADERS: (1) **C. Duilius, M. Atilius Regulus, P. Claudius Pulcher, C. Lutatius Catulus;** (2) Hamilcar Barca, Himilco, Hanno.

CHIEF ACTIONS: (1) **Agrigentum, Mylæ, Ecnomus, Panormus, Ægadian Islands;** (2) Siege of Lilybæum, Drepana.

RESULTS: Carthaginians surrender Sicily and pay a war indemnity. Carthage retains the Western Mediterranean and Rome is launched on her career of conquest.

SECOND PUNIC WAR.—218-201 B. C.

(1) **Romans** vs. (2) Carthaginians.

CAUSES: A duel to the death between East and West. Pretext, Hannibal's attacks on Saguntum in Spain.

LEADERS: (1) **Q. Fabius Maximus, Publius Scipio, P. Cornelius Scipio Africanus;** (2) Hannibal, Hasdrubal.

CHIEF ACTIONS: (1) **Syracuse, Capua, Metaurus, Zama;** (2) Ticinus, Trebia, Trasimene, Cannæ.

RESULTS: Hannibal succumbs as a result of the loyalty of Italy. Carthage forced to give up Spain, to pay an annual tribute, to surrender her fleet, and to agree not to go to war without the permission of Rome.

FOUR MACEDONIAN WARS.—214-146 B. C.

(1) **Romans** vs. (2) Greeks.

CAUSE: Alliance of Philip, King of Macedon with Carthage.

LEADERS: (1) **T. Quinctius Flaminius, L. Aemilius Paulus;** (2) Philip of Macedon, Perseus.

CHIEF ACTIONS: (1) **Cynoscephalæ, Pydna.**

RESULT: Macedonia becomes a Roman province.

THIRD PUNIC WAR—149-146 B. C.

(1) **Romans** vs. (2) Carthaginians.

CAUSE: War of Carthage with Massinissa gives Rome the pretext for completing the destruction of Carthage.

LEADERS: (1) **Scipio, Æmilianus, Africanus.**

CHIEF ACTIONS: (1) **Siege of Carthage.**

RESULT: Carthage destroyed. Most of her territory becomes a Roman province of Africa.

JUGURTHINE WAR.—111-105 B. C.

(1) **Romans** vs. (2) Jugurtha of Numidia.

CAUSE: Jugurtha, disregarding intervention of Rome, captures Citra and massacres male population.

LEADERS: (1) **C. Marius;** (2) Jugurtha.

CHIEF ACTIONS: (1) **Muthul, Citra.**

RESULTS: Numidia divided. The war reveals the corruption and incapacity of the Senatorial government of Rome.

MARSIAN OR SOCIAL WAR.—90-88 B. C.

(1) **Romans** vs. (2) Italian Allies.

CAUSE: Italian socii (allies) are denied the right of Roman citizenship.

LEADER: (1) **C. Marius, Sulla.**

CHIEF ACTION: (1) **Asculum.**

RESULT: Italians form a Federal republic, Italia, with capital at Corfinium. Roman citizenship granted to all Italian residents.

FIRST ROMAN CIVIL WAR—88-82 B. C.

(1) **Optimates** vs. (2) Democrats.

CAUSE: Reform measures of Sulpicius are carried by means of violence. Command of army of Asia is transferred from Sulla to Marius.

LEADERS: (1) **Sulla, Pompey;** (2) Marius, Cinna, Sertorius, Carbo.

CHIEF ACTIONS: **Sacriportis, Colline, Gate, Sulla's proscriptions;** (2) Marius's Reign of Terror.

RESULT: Sulla is appointed dictator.

THREE MITHRIDATIC WARS—88-63 B. C.

(1) **Romans** vs. (2) Pontines and Armenians.

CAUSES: Ambition of Mithridates VI. and Roman interference.

LEADERS: (1) **Sulla, Lucullus, Pompey;** (2) Mithridates (Pontus), Tigranus (Armenia).

CHIEF ACTIONS: (1) **Chæronea, Orchomenus,**

THE GREAT FOREIGN WARS OF UNIVERSAL HISTORY—Continued

Cabira, Tigranocerta; (2) Massacre of Italians in Asia.
RESULTS: Reorganization of the East; Pontus, Syria and Cilicia become Roman provinces.

GLADIATORIAL AND THIRD SERVILE WAR.—73-71 B. C.
(1) **Romans** vs. Revolted Gladiators and Slaves.
CAUSE: Uprising of a band of gladiators, escaped from Capua and joined by many slaves of southern Italy.
LEADERS: (1) **Crassus, Pompey;** (2) Spartacus.
CHIEF ACTIONS: (1) **Silarus;** (2) Mt. Vesuvius.
RESULTS: Revolt put down with cruelty, six thousand crucified.

GALLIC WAR—58-51 B. C.
(1) **Romans** vs. (2) Tribes of Gaul.
CAUSE: Desire to extend the Roman empire.
LEADERS: (1) **Julius Cæsar;** (2) Vercingetorix, Ariovistus.
CHIEF ACTION: (1) **Siege of Alesia.**
RESULTS: Conquest and organization of Gaul by Cæsar. Gauls Romanized; boundaries of the old world enlarged (Cæsar's expedition to Britain 55-54 B. C.); means acquired for changing Rome into a monarchy.

SECOND ROMAN CIVIL WAR.—49-31 B. C.
First period, 49-45 B. C.
(1) **Followers of Cæsar (democrats)** vs. (2) Followers of Pompey (republican aristocrats).
CAUSE: Struggle for mastery between Cæsar, conqueror of Gaul, and Pompey, conqueror of the East.
LEADERS: (1) **Cæsar;** (2) Pompey and his sons.
CHIEF ACTIONS: (1) **"Crossing the Rubicon," Pharsalus, Thapsus, Munda.**
RESULT: Cæsar is appointed dictator for life. He is the founder of the new monarchy at Rome.
Second period—43-42 B. C.
(1) **Friends of Cæsar (Second Triumvirate)** vs. (2) Cæsar's Assassins.
CAUSE: Assassination of Cæsar, 44 B. C.
LEADERS: (1) **Antony, Octavius, Lepidus;** (2) Brutus, Cassius, Sextus Pompey.
CHIEF ACTIONS: (1) **New proscription (Murder of Cicero), Philippi.**
RESULT: Brutus and Cassius, defeated, commit suicide.
Third period—31-30 B. C.
(1) **Octavius** vs. (2) Antony.
CAUSE: A continued struggle for supreme power.
LEADERS: (1) **Octavius;** (2) Antony, Cleopatra.
CHIEF ACTIONS: (1) **Actium.**
RESULTS: Triumph of Octavius, grand nephew of Julius Cæsar. End of the republic and beginning of the empire.

JEWISH WAR—A. D. 66-70.
(1) **Romans** vs. (2) Jews.
CAUSE: Revolt of the Jews against Rome.
LEADER: (1) **Titus, son of Emperor Vespasian.**
CHIEF ACTION: (1) **Siege of Jerusalem.**
RESULT: Destruction of Jerusalem and the temple.

DACIAN WARS.—86-90, 101-102, 105-107.
(1) **Romans** vs. (2) Dacians.
CAUSE: Rome desires to extend her conquests.
LEADERS: (1) **Domitian, Trajan;** (2) Decebalus.
RESULTS: Dacia is made a Roman province. Roman conquest and empire reaches its highest point.

CIVIL WARS OF THE ROMAN EMPIRE.—193-284.
CAUSES: Contests for the throne among rival generals (barrack emperors).
RESULT: Reorganization of empire by Diocletian (284-305).

WARS OF CONSTANTINE THE GREAT FOR THE EMPIRE.—310-323.
(1) **Constantine** vs. (2) Others, Augusti.
CAUSES: Confusion following abdication of Diocletian.
LEADERS: (1) **Constantine;** (2) Maxentius, Maximinus, Licinius.
CHIEF ACTION: (1) **Turin.**
RESULTS: Constantine becomes sole ruler of Roman empire. He redistricts the empire, moves the capital to Constantinople and recognizes Christianity.

INVASION OF ROMAN EMPIRE BY NORTHERN BARBARIANS—375-493.
(1) **Romans** vs. (2) Teutons and (Huns), Teutonic Tribes; Visigoths, Vandals, Suevi, Franks, Burgundians, Ostrogoths, Alemanni, Jutes, Saxons, Angles, Lombards.
CAUSES: The Huns (Mongolians) press upon the Teutons, who are forced to seek new lands within the boundaries of the Roman empire.
LEADERS: (1) **Valens, Stilicho Ætius, Leo (bishop of Rome);** (2) Alaric; Walja (Visigoth); Genseric (Vandal); Hengist and Horsa (Saxons) Attila; (Hun); Theodoric the Great (Ostrogoth).
CHIEF ACTIONS: (1) **Battle near Chalons (451);** (2) Adrianople, Sack of Rome.
RESULTS: Visigothic kingdom of Tolosa (Toulouse) (415-507). Vandals settle in Africa (429-534). Carthage (439).
Burgundians occupy Rhone Valley (443).
Angles, Saxons and Jutes invade England (449), Huns and Ostrogoths ravage Gaul.
Huns destroy Aquiliea and Venice founded (452).
Vandals plunder Rome (455).
Odoacer gains ascendency in Rome. The fall of the Roman empire (476).
Ostrogothic kingdom in Italy (493-555).
Overthrow of the Roman empire in the West, though it continued in the East until 1453. This blending of Roman and Teutonic elements under the influence of the Christian religion and what remained of classic civilization formed the civilization of the middle ages.

WARS OF JUSTINIAN—533-534.
(1) **Eastern Empire** vs. (2) Vandals in Africa and (3) Ostrogoths in Italy—535-555.
CAUSE: Desire to restore West to Eastern empire.
LEADERS: (1) **Belisarius, Narses;** (3) Vitiges Totila.
CHIEF ACTION: (1) **Battle of Taginae (552).**
RESULTS: Destruction of Vandal power in Africa and of the Ostrogothic kingdom in Italy. Exarchate established at Ravenna.

WARS OF THE FRANKS—486-814.
(1) **Franks** vs. (2) Neighboring Peoples.
CAUSES: Desire to extend the limits of Frankish territory and to ward off attacks from without.
LEADERS: (1) **Clovis (486-511), Charles Martel (814-741), Pepin the Short (751-768), Charlemagne (768-814).**
CHIEF ACTIONS: (1) **Soissons (486), Clovis conquers Alemanni and becomes a Catholic Christian (496), Battle of Tours (732), Conquest of Burgundy (534), Charlemagne conquers Lombards (774-776), Saxons (772-804), Bavarians (788), Avars (791), Northern Spain (778).**
RESULTS: Franks become leading power in the West and revive the Western Empire. (Christmas day, 800).

HEPTARCHIC WARS IN ENGLAND—588-828.
CAUSES: Struggle for supremacy among the seven Teutonic kingdoms.
LEADERS: Ethelbert (Kent), Edwin (Northumbria), Offa (Mercia), Egbert (Wessex).
CHIEF EVENTS: The supremacy was successively held by kings of Kent, Northumbria, Mercia, and Wessex, Maserfield (642), Ellandun (825).
RESULT: All England at last united under Egbert, king of Wessex (802-837).

SARACEN OR MOHAMMEDAN WARS—632-1492.
CAUSE: Saracens are ambitious to found a world wide Mohammedan empire.
LEADERS: (1) **Omar, Amru, Hassan, Mousa, Tarik, Abderrahman, Mohammed II., Abdallah;** (2) Yezdegerd (Persia), Leo the Isaurian, Charles Martel, Constantine, Palæologus, Ferdinand of Aragon.
CHIEF ACTIONS: (1) **Yarmouk (Syria), Damascus Jerusalem Cadesia(Persia), Alexandria, Carthage(697), Xeres (Spain), Granada, Toledo;** (2) Constantinople (716), Tours, Jerusalem, Las Navas de Tolosa (1212).
(1) **Constantinople** (1453).
(2) Granada (1492).
RESULTS: The Saracens attempted to conquer and convert Europe at three different times between 710 and 1492. Their power began to wane from the latter date.

NORTHMEN INVASIONS—Ninth and Tenth Centuries.
(1) **Northmen** vs. (2) People of Western and Southern Europe.
CAUSES: Opportunity for plunder and conquest and later the driving out of adventurous spirits by the organization of settled kingdoms in the north.
LEADERS: (1) **Hastings, Rolf, Sweyn, Canute** (2) Alfred (England), Odo (France).
CHIEF EVENTS: In England—Treaty of Wedmore, Massacre of Danes (1002).
In France: Siege of Paris. Grant of Normandy to Rolf (977).
RESULTS: The Northmen are the last swarm of Teutonic conquerors. They readily assimilate civilization and infuse new energy into western Europe.

NORMAN CONQUEST—1066.
(1) **Normans** vs. (2) English.
CAUSE: William, duke of Normandy wishes to increase his territory and his power.
LEADERS: (1) **William the Conqueror;** (2) Harold, king of England.
CHIEF ACTION: (1) **Hastings.**

THE GREAT FOREIGN WARS OF UNIVERSAL HISTORY—Continued

RESULTS: The king received added power and a modified feudalism introduced into England. Southern Italy and Sicily were also conquered by bands of Normans in the eleventh century and the kingdom of Naples founded.

CRUSADES—1096-1270.

(1) **European Christians** vs. (2) Turks and Moslems.

First Crusade—1096-1099.

CAUSES: The appeal of the eastern emperor for aid, the desire to recover the Holy Sepulcher from the infidels, the love of adventure, and hope of gain.

LEADERS: (1) **Peter the Hermit, Godfrey of Bouillon, Bohemond of Tarentum, Robert of Normandy.**

CHIEF ACTIONS: (1) **Nicæa, Antioch, Jerusalem.**

RESULTS: Jerusalem is subdued and a transient kingdom is founded at Jerusalem.

Second Crusade—1147-1149.

CAUSE: The conquest of Edessa by the Moslems threatens Jerusalem. Preaching of Saint Bernard.

LEADERS: (1) **Conrad III. of Germany, Louis VII. of France.**

CHIEF ACTION: Unsuccessful attack on Damascus.

RESULTS: Armies almost annihilated by hunger, disease and the enemy.

Third Crusade—1189-1192.

CAUSE: Capture of Jerusalem by Saladin.

LEADERS: **Richard I. of England, Philip Augustus of France, Frederick Barbarossa of Germany;** (2) Saladin.

CHIEF ACTIONS: (1) **Acre.**

RESULTS: The Latin Christians secure by treaty the privilege of visiting the tomb of Christ for three years without molestation.

Fourth Crusade—1201-1204.

(1) **Crusaders** vs. (2) Eastern Empire.

CAUSES: Appeals of Innocent III. Through influence of the Venetians the Crusaders turn aside to attack Constantinople.

LEADERS: (1) **Dandolo, Doge of Venice, Baldwin of Flanders.**

CHIEF ACTION: (1) **Sack of Constantinople.**

RESULTS: Division of eastern empire. The Venetians get the monoply of trade and most of the islands and coast lands of the Ægean and Ionian seas. The remainder is erected into a feudal state, the Latin empire.

Children's Crusade (legendary)—1212.

CAUSES: Ignorant enthusiasm aroused by visions and miraculous tales.

LEADER: A shepherd lad, Stephen of Vendome.

CHIEF EVENTS: Thousands of children, women and peasants march from France and Germany to the Mediterranean.

RESULTS: Only a small number return home; the others perish on the way or are sold into slavery by French merchants.

Fifth Crusade—1228-1229.

CAUSE: Vow of Frederick II. of Germany. He goes under pope's excommunication.

LEADER: (1) **Frederick II.**

RESULTS: Frederick, by treaty with the sultan, secures a truce for ten years and the restoration of Bethlehem, Nazareth and Jerusalem to the Christians; Jerusalem is finally lost in 1244.

Sixth Crusade—1248-1254.

CAUSE: Louis IX. of France starts on a crusade via Egypt.

LEADERS: (1) **Louis IX., later St. Louis.**

CHIEF ACTIONS: (1) **Damietta;** (2) Expedition to Cairo.

RESULT: Louis is captured in battle and released on payment of heavy ransom and evacuation of Damietta.

Last, Seventh Crusade—1270-1291.

CAUSES: Louis IX. goes against Mohammedans of Tunis, Prince Edward of England to Syria.

LEADER: (1) **Louis IX., Prince Edward.**

CHIEF EVENTS: Death of Louis by the plague; (2) Acre, last Christian stronghold in Syria, falls (1291).

RESULTS: The results of the crusades were development of commerce, introduction of new customs, products and manufactures, increase in freedom of lower classes, especially townsmen, and the power of the crown.

WAR OF THE EMPIRE—1158-1183.

(1) **Empire** vs. (2) Italian Communes.

CAUSE: Frederick Barbarossa's attempt to restore imperial rights over the cities of northern Italy.

LEADERS: (1) **Frederick I. Barbarossa;** (2) Pope Alexander III.

CHIEF ACTIONS: (1) **Milan** (1162); (2) Legnano (1176).

RESULTS: By treaty of Constance (1183) the cities of Lombardy are recognized as practically self-governing republics, the barest overlordship remaining to the emperor.

WARS OF THE BARONS IN ENGLAND—1215-1265.

(1) **Barons** vs. (2) Kings John and Henry III.

CAUSES: Misgovernment of John and Henry III.

LEADERS: (1) **Stephen Langton, Simon de Montfort;** (2) King John, Prince Edward, later Edward I.

CHIEF EVENTS: (1) **Signing of Magna Charta, Lewes, Simon de Montfort's Parliament;** (2) Evesham.

RESULTS: The beginning of constitutional monarchy —henceforth the king is below the law, not above it.

HUNDRED YEARS' WAR—1337-1453.

(1) **English** vs. (2) French.

CAUSES: The conflict of interests of the French and English kings in Guienne, Flanders and Scotland. Edward III. advances claim by descent to the throne of France.

LEADERS: (1) **Edward III., Edward the Black Prince, Prince Henry V., Duke of Bedford;** (2) Du Guesclin, Charles V., Joan of Arc.

CHIEF ACTIONS: (1) **Crécy, Calais, Poitiers, Peace of Bretigny, Agincourt, Treaty of Troyes;** (2) Orleans (1429), Castillon (1453).

RESULTS: England loses all her land in France except Calais. During the earlier stage of this war about one-third of the population of western Europe perished from the Black Death.

AUSTRO-SWISS WAR—1315-1388.

(1) **House of Hapsburg** vs. (2) Swiss Confederation.

CAUSES: Hapsburgs assert feudal rights over the peasants of the Swiss cantons.

LEADERS: (1) **Leopold III. of Austria;** (2) Arnold von Winkelried.

CHIEF ACTIONS: (2) Morgarten, Sempach, Näfels.

RESULT: Independence of Swiss secured.

HUSSITE WAR—1419-1436.

(1) **Bohemian Followers of John Huss** vs. (2) Catholic Europe.

CAUSES: Execution of John Huss, the Bohemian religious reformer, by the council of Constance.

LEADERS: (1) **Ziska, Procopius the Great;** (2) Emperor Sigismund, Cardinal Cesarini, Frederick of Brandenburg.

CHIEF EVENTS: Revolt of Prague. Four crusades repulsed.

RESULTS: After the overthrow of the radical Hussites (Taborites) by the conservative Hussites (Calixtines) in the battle of Lipan a Catholic reaction set in which culminated in 1462 with the revocation of the compacts made by the Council of Basel with the Hussites.

WARS OF THE ROSES—1455-1485.

(1) **Yorkists (White Rose)**; vs (2) Lancastrians (Red Rose).

CAUSES: Misgovernment under Henry VI. encourages Richard, duke of York, representing the second line of descent from Edward III., to claim the throne against Henry VII. (third line).

LEADERS: (1) **Richard, duke of York, Edward IV., Richard III.;** (2) Duke of Somerset, Queen Margaret, Earl of Warwick ("King-maker"), first a Yorkish and then a Lancastrian, Henry VII.

CHIEF ACTIONS: (1) **St. Albans, Northampton, Mortimer's Cross, Towton, Barnet, Tewkesbury;** (2) Wakefield, Bosworth Field.

RESULTS: Henry Tudor (Lancastrian in the female line) secures throne as Henry VII. By his marriage with Elizabeth of York he unites the warring factions and establishes an almost despotic rule in England.

WARS FOR CONTROL OF ITALY—1494-1529.

(1) **French** vs. (2) Spanish.

CAUSES: Conflicting claims to the throne of Naples and to the duchy of Milan.

LEADERS: (1) **Charles VIII., Louis XII., Bayard, Francis I.;** (2) Ferdinand of Aragon, Charles V., duke of Bourbon, Fürstenburg.

CHIEF ACTIONS: Invasion of Italy by Charles VIII. (1494), League Cambray (1508), Holy League (1511).

(1) **Marignano;** (2) Pavia.

RESULTS: All the leading powers of western Europe were drawn into this struggle. By the peace of Cambraes (1529), France renounced her claims to Italy. One effect of these wars was to tie the hands of Charles V. so as to prevent his putting down Lutheranism in Germany.

SCHMALKALDIC WAR—1546-1547.

(1) **Charles V.** vs. (2) League of Schmalkalden.

CAUSES: Charles V. attempts to crush Protestantism in Germany.

LEADERS: (1) **Emperor Charles V., Duke Maurice of Saxony;** (2) John Frederic, Elector of Saxony, Philip, Landgrave of Hesse.

CHIEF ACTION: (1) **Mühlberg.**

RESULTS: Protestantism temporarily crushed. Its recovery in 1552 was followed by the religious peace of Augsburg 1555.

THE GREAT FOREIGN WARS OF UNIVERSAL HISTORY—Continued

RELIGIOUS WARS IN FRANCE—1562-1598.

(1) **Catholics** vs. (2) Huguenots (Protestants).

CAUSE: Massacre of Huguenots at Vassy is a signal for uprising.

LEADERS: (1) **Duke of Guise, Henry III.;** (2) Catherine de Medici, Conde, Coligny, Henry of Navarre (Henry IV.)

CHIEF EVENTS: (1) **Massacre of St. Bartholomew** (1572); (2) Siege of Paris, Ivry (1590), Henry of Navarre becomes a Catholic (1593). Riots of Image Breakers. Council of Blood.

RESULTS: By the edict of Nantes (1598) the Huguenots are given equal political rights with Catholics, limited freedom of worship, the possession of La Rochelle and other strong places as cities of refuge.

WAR OF LIBERATION IN THE NETHERLANDS—1568-1648.

(1) **Spain** vs. (2) Revolted provinces in the Netherlands.

CAUSES: Political and religious tyranny of Spain. Duke of Alva enforces the Inquisition.

LEADERS: (1) **Duke of Alva, Alexander of Parma;** (2) William of Orange, Jan van Olden, Barneveldt, Maurice of Nassau.

CHIEF ACTIONS: (1) **Mechlin, Haarlem;** (2) Brill, Siege of Leyden, "Spanish Fury" at Antwerp, Pacification of Ghent (1576), Union of Utrecht (1579), Declaration of Independence (1581).

RESULTS: By the Peace of Westphalia (1648) the independence of the seven northern provinces, the United Netherlands, is recognized. The ten southern provinces continue under Spanish rule until 1713.

THIRTY YEARS' WAR—1618-1648.

(1) **German Protestants and their Allies, England, Holland, Sweden and France** vs. (2) Imperial German Catholics and their Allies, Spain, Italy.

CAUSES: Disputes over interpretation of peace of Augsburg (religious and political disputes leading to the revolt of Bohemia). The war passes through four phases: (1) Bohemian-Palatinate, (2) Danish, (3) Swedish, (4) Swedish-French.

LEADERS: (1) **Frederick, Elector Palatine, Mansfield, Gustavus Adolphus (Sweden), Turenne and Conde (France);** (2) Emperor Ferdinand II., Maximilian of Bavaria, Tilly, Wallenstein.

CHIEF ACTIONS: (1) **Stralsund, Edict of Restitution, Breitenfeld, Lützen;** (2) White Hill, Magdeburg, Nördlingen.

RESULTS: This war is closed by the peace of Westphalia. Alsace thereby goes to France, Switzerland is separated from the empire and the Palatinate is divided. The secularized lands of northern Germany are secured to Protestanism, while leaving to Catholicism Austria, Bohemia and Bavaria. Germany is left desolate.

CIVIL WAR IN ENGLAND—1642-1649.

(1) **Royalists (Cavaliers)** vs. (2) Parliamentarians (Roundheads) allied with Scots (to 1647).

CAUSES: Charles I. attempts to force a personal government on England. His disputes with Parliament covered (1) taxation, (2) privileges of Parliament, (3) religion, (4) control of the militia.

LEADERS: (1) **Charles I., Prince Rupert, Montrose;** (2) Cromwell, Essex, Fairfax, Leslie.

CHIEF ACTIONS: (2) Marston Moor, Naseby, Preston.

RESULTS: The second civil war (1648) determines the army leaders to bring Charles I. to trial and execution (1649). A Commonwealth was then established without King or House of Lords but with Oliver Cromwell as Protector (1653 to 1659). The son of Charles I. restored in 1660 as Charles II.

FIRST THREE WARS OF LOUIS XIV.—1667-1697.

(1) **France** vs. a. Spanish Netherlands; b. Dutch republic; c. Grand Alliance (German States, England, Holland).

CAUSES: Louis XIV.'s passion for fame and desire to increase French territory in Europe.

LEADERS: (1) **Turenne, Conde, Luxembourg;** (2) William III., De Ruyter.

CHIEF ACTIONS: (1) **Ravaging of Palatinate, Steenkirke, Neerwinden;** (2) Sasbach, La Hogue, Namur.

RESULT: Extension of boundaries of France to the northeast.

SPANISH SUCCESSION (in America), QUEEN ANNE'S WAR—1701-1714.

(1) **France, Spain and Bavaria** vs. (2) Austria, England, Holland, Portugal, Savoy.

CAUSES: Acceptance by Louis XIV. of the bequest of the Spanish dominion to his grandson, Philip of Anjou, in violation of the partition treaty to which he had consented.

LEADERS: (1) **Vendome Villars, Leopold of Dessau;** (2) Duke of Marlborough, Eugene of Savoy, Heinsius.

CHIEF ACTIONS: (2) Gibraltar, Blenheim, Ramillies, Turin, Oudenarde, Malplaquet.

RESULTS: By the peace of Utrecht in 1713 and that of Rastadt in 1714 Spain and the Indies go to Philip of Anjou; Naples, Milan, Sardinia and former Spanish Netherlands to the Austrians. England receives Newfoundland, Acadia and Hudson Bay Territory from France and Gibraltar from Spain.

NORTHERN WAR—1700-1721.

(1) **Sweden** vs. (2) Russia, Poland, Denmark, Saxony.

CAUSES: Peter the Great joins Poland, Denmark and Saxony for the purpose of despoiling Sweden, the first power of the north, of her Baltic ports.

LEADERS: (1) **Charles XII.;** (2) Peter the Great (Russia), Augustus II. of Saxony.

CHIEF ACTIONS: (1) **Invasion of Denmark, Narva, Invasion of Saxony;** (2) Pultava.

RESULTS: By the peace of Nystadt (1721) Sweden cedes large territories to Russia. Russia takes the place of Sweden as the foremost power of the north.

WAR OF THE AUSTRIAN SUCCESSION—1740-1748.

(1) **Austria, supported by Hungary, Bohemia, England, Holland and Saxony** vs. (2) Prussia, France, Spain, Bavaria.

CAUSES: When Maria Theresa succeeded her father, Charles IV. of Austria, Frederick the Great of Prussia seized Silesia. This precipitated a struggle for Austrian territories. At the death of Charles VI. of Austria the right of Maria Theresa to the throne is contested chiefly by Frederick the Great of Prussia, who seizes Silesia.

LEADERS: (1) **Maria Theresa, George II. of England, Charles of Lorraine;** (2) Frederick the Great of Prussia, Emperor Charles VII., Schwerin.

CHIEF ACTIONS: (1) **Dettingen;** (2) Mollwitz, Chotusitz, Prague, Fontenoy, Hohenfriedburg, Soor.

RESULTS: By the treaty of Aix-la-Chapelle Silesia is secured to Prussia, which state now becomes a great European power. This war is one phase of the long rivalry between France and Great Britain for sea power and dominion in America and India.

SEVEN YEARS' WAR, OR THIRD SILESIAN WAR; In America: **FRENCH AND INDIAN WAR**—1756-1763.

(1) **England, Prussia** vs. (2) France, Austria, Russia and Spain, Sweden.

CAUSES: Maria Theresa wishes to regain Silesia. Hostilities between French and English in America and India. George II.'s concern for his ancestral territory of Hanover.

LEADERS: (1) **Frederick the Great, Duke of Cumberland, Wolfe (America), Robert Clive (India);** (2) Daun (Austria), Charles of Lorraine, Montcalm (America).

CHIEF ACTIONS: (1) **Dresden, Rossbach, Leuthen, Zorndorf, Minden;** (2) Kolin, Hohkirchen, Kunersdorf.

In America: (1) **Louisburg, Fort Duquesne, Quebec.**

In India: (1) **Plassey, Wandewash.**

RESULTS: The peace of Paris (1763) gives England Canada, the supremacy in India and certain islands, especially in the West Indies. Prussia retains Silesia. This war really founded the British empire which is based on sea power and colonial dominion.

WARS OF THE FRENCH REVOLUTION—1792-1802.

(1) **Revolutionary France** vs. (2) Coalitions of England, Austria, Prussia, Holland and Spain. The Empire, Russia.

a. First Coalition—1792-1797.

CAUSES: Intrigues of emigrés; horror of Europe at the execution of the king; French offer of aid to revolutionists in other countries.

LEADERS: (1) **Dumouriez, Kellermann, Jourdan, Hoche, Pichegru, Napoleon Bonaparte, Moreau;** (2) Duke of Brunswick, Coburg, Charles of Austria.

CHIEF ACTIONS: (1) **Valmy, Occupation of Nice and Savoy, Jemmapes, Execution of king (1793), Annexation of Belgium, Fleurus, Lodi, Siege of Mantua;** (2) Mainz, Neerwinden, Kaiserslautern, Wurzburg.

RESULTS: By peace of Campo Formio (1797) the French frontier is advanced to the Rhine, Venice is given to Austria and the Cisalpine and Ligurian republics founded in Italy under French control.

b. Bonaparte's Egyptian Expedition—1798-1799.

CAUSES: Bonaparte aims to prepare the way to attack Great Britain's power in India and dreams of rivaling early conquerors of the east.

LEADERS: (1) **Napoleon Bonaparte;** (2) Nelson (England).

CHIEF ACTIONS: (1) **Battle of the Pyramids;** (2) Battle of the Nile at Aboukir, Acre.

RESULTS: Nelson's victory removes a serious menace to British power in India, cuts off the French in Egypt and deprives France of communication with its best troops and ablest general.

c. Second Coalition—1799-1802.

CAUSES: The mistakes of the government of the

THE GREAT FOREIGN WARS OF UNIVERSAL HISTORY—Continued

Directory and the prestige of Nelson's victory enable Great Britain to form the Second Coalition.

LEADERS: (1) **Napoleon, Joubert, Moreau;** (2) Suvaroff, Melas, Archduke John.

CHIEF ACTIONS: (1) **Marengo, Hohenlinden;** Napoleon's passage of the Alps (Great St. Bernard); (2) Novi.

RESULTS: The Peace of Presburg ends the contest between France and Austria. Much harsher terms are imposed on Austria. Peace of Luneville with Austria (1801); Peace of Amiens with England (1802); Surrender of England's conquests except Trinidad and Ceylon; Malta to be restored to Knights of Malta.

NAPOLEONIC WARS—1802-1815.

(1) **France under Napoleon** vs. (2) European Powers led by England.

a. Third Coalition—1805.

CAUSES: Neither England nor France regarded the peace of Amiens as more than a truce. Among the many causes of friction leading to renewal of war, chief place was given to England's refusal to restore Malta.

LEADERS: (1) **Napoleon;** (2) Nelson, Mack, Alexander I. (Russia), Kutusoff.

CHIEF ACTIONS: (1) **Ulm, Austerlitz;** (2) Trafalgar.

RESULTS: As a result of his brilliant successes, Napoleon, in 1802 becomes consul for life and in 1804 took the title emperor of the French. Confirmation of treaty of Campo Formio, with the recognition of Batavian, Helvetian, Cisalpine and Ligurian republics.

b. (Fourth) War with Prussia and Russia—1806-1807.

CHIEF ACTIONS (1) **Double battle of Jena and Auerstadt, Berlin decree, Eylau (indecisive), Friedland.**

RESULTS: By the treaties of Tilsit (1807) Russia recognizes Napoleon's relatives as kings of Naples, Holland and Westphalia and consents to the creation of the Confederation of the Rhine and the grand duchy of Warsaw under Napoleon's control. Alexander and Napoleon combine to dominate Europe. Prussia cedes territories containing half her population.

c. Peninsular War—1808-1814.

CAUSES: Rebellion of Spain against Joseph Bonaparte, whom Napoleon had placed on the throne.

LEADERS: (1) **Soult, Massena;** (2) Duke of Wellington.

CHIEF ACTIONS: (1) **Corunna;** (2) Talavera, Lines of Torres Vedras, Albuera, Salamanca, Vittoria, Toulouse.

RESULTS: French expelled from the peninsula.

d. Fifth War with Austria—1809.

LEADERS: (1) **Napoleon;** (2) Archduke Charles.

CHIEF ACTIONS: (1) **Aspern, Wagram.**

RESULTS: Austria cedes thirty-two thousand square miles of territory, containing three and one-half million inhabitants.

e. Invasion of Russia—1812.

CAUSE: Alexander's refusal to enforce Napoleon's continental system, and other causes of dispute.

LEADERS: (1) **Napoleon, Marshal Ney;** (2) Kutusoff, Barclay de Tolly.

CHIEF ACTIONS: (1) **Smolensk, Borodino.** Burning of Moscow, Retreat from Moscow, Passage of the Beresina.

RESULT: Less than twenty thousand of the half million men in Napoleon's army recrossed the Russian frontier.

f. War of Liberation—1813-1814.

CAUSES: The disastrous Russian campaign, together with the steady progress of the British in the peninsular war encouraged the oppressed states of Germany to rise against Napoleon's tyranny, Prussia taking the lead.

LEADERS: (1) **Napoleon, Ney, Macdonald;** (2) Frederick, William III., Francis I., Alexander I., Schwarzenberg, Blücher, Bernadotte.

CHIEF ACTIONS: (1) **Lützen, Bautzen, Dresden;** (2) Dennewitz, Leipzig, (Battle of the Nations). Allies enter Paris.

RESULTS: Driven from Russia in 1812, from Germany in 1813, Napoleon in 1814 was forced to surrender France itself. By the treaty of Fontainebleau he was given the Island of Elba and an annual revenue of two million francs.

g. Waterloo Campaign—1815.

CAUSES: Quarrels among the allies and dissatisfaction of French with Louis XVIII. tempt Napoleon to return from Elba.

LEADERS: (1) **Napoleon, Ney;** (2) Wellington, Blücher.

CHIEF ACTIONS: Napoleon lands at Cannes (March 1); enters Paris March 20.

(1) **Ligny;** (2) Quatre Bras, Waterloo (June 18).

RESULTS: Waterloo marks the final downfall of Napoleon. He is transported to the island of St. Helena, where he died in 1821. In the Congress of Vienna the allies reconstructed Europe, restoring in general the legitimate rulers and erecting barriers against democratic movements and liberal ideas.

WAR OF GRECIAN INDEPENDENCE—1821-1829.

(1) **Greeks, aided by England, Russia and France** vs. (2) Turks.

CAUSES: Revived feeling of Greek nationality, stimulated by a widespread secret society working for a restoration of a Greek empire at Constantinople.

LEADERS: (1) **Ypsilanti, Diebitsch** (Russia), **Codrington** (England), **Byron** (England); (2) Ibrahim, Pasha.

CHIEF ACTIONS: Massacre of Greeks at Chios.

(1) **Navarino, Adrianople;** (2) Missolonghi.

RESULTS: The treaty of Adrianople, 1829, compelled Turkey to acknowledge the independence of Greece, which chose as king the Bavarian prince Otto I.

CRIMEAN WAR—1854-1856.

(1) **Russia** vs. (2) Turkey aided by Great Britain, France and Sardinia.

CAUSES: The question of the political status and future of the lands of the Turkish empire. Immediate cause, the claim of Russia to a protectorate over all Greek Christians living under the sultan's rule.

LEADERS: (1) **Mentchikoff, Gortchakoff;** (2) Canrobert, Pelissier (France), Raglan, Simpson (England).

CHIEF ACTIONS: (1) **Balaclava;** (2) Alma, Siege of Sebastopol, Inkermann.

RESULTS: In the peace of Paris (1856) Russia's claim to a protectorate is disallowed, the Danube is opened to navigation and the Black Sea is closed to war vessels of all powers.

SEPOY MUTINY—1857-1858.

(1) **Sepoys** vs. (2) English.

CAUSES: Uneasiness created by the rapid progress of British ways and rule causes a revolt of native Sepoy troops of India. Immediate cause the rumor that cartridges furnished troops were greased with a mixture of hog and beef fat—the one animal an object of loathing to Mohammedans, the other of religious worship to the Hindu.

LEADERS: (1) **Nana Sahib;** (2) Nicholson, Havelock, Campbell.

CHIEF ACTIONS: Mutiny of Sepoys at Meerut.

(1) **Massacre at Cawnpore;** (2) Delhi, Relief of Lucknow.

RESULTS: Following the supression of the mutiny the charter of the East India company is revoked and India passes directly under the crown, a secretary of state for India being added to the British ministry.

WAR OF ITALIAN LIBERATION—1859.

(1) **Sardinia-Piedmont and France** vs. (2) Austria.

CAUSES: Since 1848 Sardinia-Piedmont had been the center of the movement for Italian unity. Following promises of aid from Napoleon III. Cavour traps Austria into declaring war over the question of disarmament.

LEADERS: (1) **Victor Emmanuel, Napoleon III., Garibaldi;** (2) Francis Joseph II., Gyulay.

CHIEF ACTIONS: (1) **Montebello, Magenta, Solferino.** Peace signed at Zurich, November 10, 1859.

RESULTS: By this war Victor Emmanuel gained Lombardy. In 1860 Tuscany, Parma, Modena and the papal legations were added. In 1861 he gained Sicily and Naples, together with the title King of Italy. Venetia followed as a result of alliance with Prussia in 1866 and the addition of Rome in 1871 completed the unification of Italy.

DANISH WAR—1864.

(1) **Austria and Prussia** vs. (2) Denmark.

CAUSES: Incorporation of the duchy of Schleswig with Denmark in violation of treaty of 1852.

LEADERS: (1) **Gablenz (Austria), Prince Frederick, Charles (Prussia);** (2) Dermeza, Gerlach.

CHIEF ACTIONS: (1) **Invasion of Jutland, Storming of Düppel.**

RESULTS: Denmark gives up Schleswig-Holstein, which is jointly administered by Austria and Prussia.

AUSTRO-PRUSSIAN WAR—1866.

(1) **Prussia with smaller North German States and Italy** vs. (2) Austria, Hanover, Saxony, and South German States.

CAUSES: Friction over Schleswig-Holstein enables Bismarck to force Austria into a war for supremacy in Germany.

LEADERS: (1) **William I., Prince Frederick, Charles, Moltke, Victor Emmanuel;** (2) Benedek, Archduke Albert, Gablenz, Prince Charles of Bavaria.

CHIEF ACTIONS: In Bohemia: (1) **Soor, Koniggrätz or Sadowa;** (2) Trautenau. *In the West:* (1) **Aschaffenburg;** (2) Langensala. *In Italy:* (2) Custozza, Lissa.

RESULTS: Closed with the peace of Prague, August 23, 1866, which authorized the re-establishment of the

GREAT FOREIGN WARS OF UNIVERSAL HISTORY—Continued

federated German states, excluding Austria; Austria ceded Venetia to Italy, and her rights in Schleswig-Holstein to Prussia. Hanover, Hesse, Nassau are also annexed to Prussia.

FRANCO-PRUSSIAN WAR—1870-1871.

(1) France vs. (2) **Prussia** supported by all German States.

CAUSES: Jealousy of France at Prussian gains and friction over Hohenzollern candidacy for the throne of Spain. Bismarck's falsification of the "Ems dispatch" tricked France into a declaration of war.

LEADERS: Napoleon III., MacMahon, Bazaine; (2) **William I., Moltke, Prince Frederick Charles, Crown Prince Frederic William.**

CHIEF ACTIONS: (1) **Saarbrucken;** (2) Weissenberg, Wörth, Vionville, Gravelotte, Sedan, Capitulation of Metz, Orleans, Capitulation of Paris.

RESULTS: Closed in 1871 with the treaty of Versailles with the following results: (1) The French military power was destroyed; (2) the western frontier of Germany was rendered secure; (3) The German empire was established; (4) Germany acquired Alsace and Lorraine. In France Napoleon III. is deposed and the Third Republic established, 1870.

RUSSO-TURKISH WAR—1877-1878.

(1) **Russia** vs. (2) Turkey.

CAUSES: Turkish misgovernment and revolts in her Christian subject provinces, which were barbarously put down ("Bulgarian atrocities") arouse all Europe but Russia alone declares war.

LEADERS: (1) **Grand Duke Nicholas, Gurka, Grand Duke Michael, Alexander II.;** (2) Suleiman Pasha, Osman Pasha, Mukhitar Pasha.

CHIEF ACTIONS: (1) **Passages of the Danube at Shitova, Shipka Pass, Plevna, Storm of Kars.**

RESULTS: By the peace of San Stefano as revised in the congress of the powers at Berlin, Montenegro, Servia and Roumania become independent; Bulgaria remains tributary but receives a Christian prince; Russia obtains large indemnity and part of Armenia and also Bessarabia.

CHINESE-JAPANESE WAR—1894-1895.

(1) **Japan** vs. (2) China.

CAUSES: Rival claims to suzerainty over Korea.

LEADERS: (1) **Ito, Yamagata, Oyama, Nogi;** (2) Tso, Yeh, Wei.

CHIEF ACTIONS: **Yalu River, Port Arthur, Wei-hai-wei, Niuchwang.**

RESULTS: Treaty of Shimonoseki, signed April 17, 1895, removed Korea from Chinese influence; ceded Formosa and the Pescadores to Japan, and awarded to the latter an indemnity of $180,000,000.

SOUTH AFRICAN OR BOER WAR—1899-1902.

(1) **Great Britain** vs. (2) Transvaal, Orange Free State.

CAUSES: Resistance by the Boers to the British form of government in the Transvaal.

LEADERS: (1) **Sir George White Buller, Methuen, Roberts, Kitchener, French;** (2) Cronje, Botha, De Wet, Delarey.

CHIEF ACTIONS: (1) **Siege of Ladysmith, Paardeberg;** (2) Colenso, Spion Kop, Vaal Krantz, Magersfontein.

RESULT: Boers surrendered May 31, 1902; are granted the right of self-government under British sovereignty, and united with other self-governing British colonies in South Africa, in 1910, to form the Union of South Africa.

RUSSO-JAPANESE WAR—1904-1905.

(1) **Japan** vs. (2) Russia.

CAUSES: Russian encroachments in Manchuria, and their fortification of Port Arthur.

LEADERS: (1) **Togo, Kuroki, Oku, Nodzu, Oyama, Nogi;** (2) Kuropatkin, Alexieff, Makaroff, Stoessel, Stakelberg, Linievitch.

CHIEF ACTIONS: (1) **Port Arthur and Chemulpo, Vladivostok, Yalu River, Dalny, Siege of Port Arthur, Mukden, Sea of Japan.**

RESULTS: Closed September 5, 1905, by treaty of Portsmouth by which Korea passes under control of Japan, China regains Manchuria, and Japan is granted important railroad rights.

BALKAN WAR—1912-1913.

(1) **Montenegro, Bulgaria, Servia and Greece** vs. (2) Turkey.

CAUSES: Discontent with Turkish rule in Macedonia.

LEADERS: (1) **Savoff, Dimitrieff, Putnik, Constantine;** (2) Nazim Pasha, Mukhtar Pasha, Abdullah Pasha.

CHIEF ACTIONS: (1) **Kirk Kilisseh, Lule Burgas, Monastir.**

RESULTS: Turkey appealed to the powers, November 3, 1912, for intervention, and an armistice was signed December 3, 1912, ending one of the shortest and most sanguinary wars in history. The treaty of peace was signed May 30, 1913.

(2) **Servia, Greece, Roumania, Turkey** vs. **Bulgaria.**

CAUSES: Disputes over the division of Macedonia.

CHIEF ACTIONS: Mainly astounding atrocities and the re-occupation of Adrianople by Turkey.

RESULTS: Reorganization of the Balkan states. Albania was made independent under an international commission of control; Crete was ceded to Greece; Macedonia was divided among Greece, Servia, and Bulgaria; and Roumania gained a strip from the northwest of Bulgaria. On September 17, 1913, an agreement between Bulgaria and Turkey provided that the latter retain Adrianople, Kirk Kilisseh, and Dimotika. September 28 the treaty between Bulgaria and Turkey was signed at Constantinople.

EUROPEAN WAR—1914-1918.

No war in the history of the world has equalled this conflict in mere stupendousness. In number of nations actually engaged; in its reckless abandon of human lives, destruction of wealth and the treasured creations of the ages; in titanic battles and sieges; fury of martial combat; prostitution of every known achievement of science to death-dealing devices and instrumentalities; in its subversion of the civilizing processes of morals and mind to justify the extremities and perversions of racial and human passions; in the overturning of law and order; and in the undermining of human confidence in the higher institutions of society, it stands naked and alone in its saturnalia of destruction.

THE BELLIGERENT NATIONS: This great epic destruction engulfed twenty-three nations—all driving their energies of life and economic resources toward the highest possible point of efficiency—*now* to *destroy*, but finally, let us hope, to *found* a super-civilization. The group of so-called Central Powers embraces Germany, Austria-Hungary, Turkey and Bulgaria. The opposing group of the Entente Allies—originally headed by Russia, France and Great Britain, include the following, twenty-two in all:

Serbia, Russia, France, Great Britain, Montenegro, Japan, Belgium, Italy, San Marino, Portugal, Roumania, Greece, Cuba, Panama, Siam, Liberia, China, the United States, Brazil, Hayti, Guatemala, and Honduras.

Declarations of war were made as follows:

Austria vs. Belgium, August 28, 1914; Austria vs. Montenegro, August 9, 1914; Austria vs. Russia, August 6, 1914; Austria vs. Serbia, July 28, 1914.

Bulgaria vs. Serbia, October 14, 1915; China vs. Austria, August 14, 1917; China vs. Germany, August 14, 1917; Cuba vs. Germany, April 7, 1917.

France vs. Austria, August 12, 1914; France vs. Bulgaria, October 18, 1915; France vs. Germany, August 3, 1914.

Germany vs. France, August 3, 1914; Germany vs. Portugal, March 9, 1916; Germany vs. Russia, August 1, 1914.

Great Britain vs. Bulgaria, October 16, 1915; Great Britain vs. Austria, August 12, 1914; Great Britain vs. Germany, August 5, 1914; Great Britain vs. Turkey, November 5, 1914.

Greece (Provisional Government) vs. Bulgaria, November 28, 1916; Greece (Provisional Government) vs. Germany, November 28, 1916; Greece vs. Bulgaria, July 2, 1917; Greece vs. Germany, July 2, 1917.

Italy vs. Austria, August 21, 1915; Italy vs. Bulgaria, October 19, 1914; Italy vs. Germany, August 28, 1916.

Japan vs. Germany, August 23, 1914; Liberia vs. Germany, August 4, 1917; Montenegro vs. Austria, August 10, 1914; Panama vs. Germany, April 7, 1917; Roumania vs. Austria, August 27, 1916.

Serbia vs. Turkey, December 2, 1914; Siam vs. Austria, July 21, 1917; Siam vs. Germany, July 21, 1917; Turkey vs. Allies, November 23, 1914; Turkey vs. Roumania, August 29, 1916; United States vs. Germany, April 6, 1917. Brazil vs. Germany, October 26, 1917; United States vs. Austria-Hungary, December 7, 1917.

CAUSES, REAL AND CONJECTURAL: The causes and justifications of the war have been variously set out and just as variously defended with conspicuous vigor and characteristic prejudice. Undoubtedly, opportunists have arisen in all countries to becloud the basic truths; and the ultimate responsibility must necessarily involve long periods of investigation, reflection and clarification by mighty and rare minds. This is all too close to our imperfect senses at the present moment. More calm, more justice, more honesty is required. All that we can now do is to set out the apparent reasons and the record of actual events as they have reached us up to the present time from various credited sources.

From the voluminous diplomatic "papers" given out from time to time by the belligerents, the nations themselves assign the following reasons:

GREAT FOREIGN WARS OF UNIVERSAL HISTORY — Continued

Austria: Because Serbia would not permit Austrian officials to take part in investigations in Serbia into the responsibility of Serbians for the murder of the Austrian Crown Prince and Princess.

Serbia: Because upon her refusal to accede to this demand of Austria on the ground that she would be sacrificing her own sovereignty, and in spite of her proposal to leave the matter to arbitration, Austria attacked her.

Russia: Because Austria was making war upon Serbia.

Germany: Because Russia declined to cease mobilizing her army — a mobilization which Germany believed was directed at herself as well as at her ally Austria.

France: Because her ally Russia was attacked by Germany.

Belgium: Because her neutral territory, whose neutrality was guaranteed by a treaty signed by Germany, was invaded by German arms.

England: Because Germany had violated the treaty guaranteeing the neutrality of Belgium, of which both Germany and England were signers.

Japan: Because her treaty with England bound her to join with England when the peace of the Far East was threatened.

United States: Because "the world should be made safe for democracy," and the dictates of humanity prevail over selfish national ambitions.

The more closely reasoned causes might be classified thus:

(1) The immediate occasion of this great conflict was the murder of the Crown Prince and Crown Princess of the Austro-Hungarian empire, on June 28, 1914, at Sarajevo, Bosnia, through the alleged instigation of a Serbian revolutionary society, called the Narodna Odbrana, which had for its purpose the disrupting of the Austro-Hungarian empire, particularly those parts inhabited largely by Serbians and other Slavic races. A peremptory demand followed on the part of the Austro-Hungarian government that Serbia suppress the criminal organization and permit the former to cooperate in the inquiry as to the accomplices on Serbian territory in the murders of the Prince and Princess. This demand was refused by Serbia, which immediately received the support of Russia, France and Great Britain, while Austro-Hungary received the support of Germany, and, later, of Turkey.

(2) The underlying causes were the following:

(a) The policy of Russia (popularly known as Pan-Slavism), an age-long political creed of Russian ambition, to dominate the Balkan countries and extend her dominions to the Bosphorus, the Ægean and the Adriatic.

(b) The ambitions of France to regain Alsace-Lorraine, lost to her by the Franco-Prussian war.

(c) Violation of Belgian neutrality by German military forces in their attempt to invade France.

(d) The political, industrial and commercial rivalry of Germany and Great Britain, involving the mastery of the "high seas," and problems of colonization.

(e) The projected "Berlin to Bagdad" railway, paralleling the "Suez route" to the Far East.

(3) More remote, but equally potent, causes are:

(a) The European political doctrine of the "Balance of Power," which was the outgrowth of the Napoleonic wars, and received its first stamp of approval at the Congress of Vienna in 1815, which settled the important boundaries of the map of Europe for more than half a century afterward. Subsequently, the "great powers" of Europe assumed the point of view that any acquisition of power, territory or population by any one of them entitled all the others to compensation; so that the relative strength and importance might not be disturbed. This rule has been applied to every important war since Napoleon's time, and any threatened disturbance of this "balance" has always had in it the germ of a general conflict. Hence arose the historic "alliances," known as the Triple Alliance, embracing Germany, Austro-Hungary and Italy, on the one hand, and the Triple Entente, comprising France, Russia and Great Britain, on the other.

(b) Prussian "Militarism," so-called, with its autocratic doctrine of force, and attendant jealousies and obstacles to social and economic reforms, which might be said to be the direct fruits of the "balance of power" doctrine, as is also the doctrine of the "guaranteed neutrality" of certain small countries of Europe, which astute European diplomacy created as "buffer" states in the event of armed or other conflicts among the "great powers."

MILITARY LEADERS: (1) *Entente Allies*, Kitchener, French, Haig, Byng, Joffre, Petain, Foch, Grand Duke Nicholas of Russia, Kouropatkin, Brusiloff, Admirals Fisher and Jellicoe, Cardona, Diaz, Pershing; (2) *Central Powers*, Emperor William II., Ludendorff, Emperor Karl of Austria, Hindenburg, Mackensen, Kluck, Falkenhayn, Archduke Frederick, Hoetzendorf, Crown Prince Frederick William, Admiral Tirpitz, Crown Prince Rupprecht, Enver Pasha.

CHIEF THEATERS OF ACTION: (1) Belgium; (2) Northern France; (3) Poland; (4) Dardanelles; (5) Serbia and Balkans; (6) Roumania; (7) Austro-Italian Front; (8) Courland and Lithuania; (9) North Sea and Inlets; (10) Mediterranean; (11) German Colonial Possessions throughout the world; (12) High Seas; (13) Italy.

RESULTS: Except for the loss of Germany's colonial possessions, the military results of the war to July, 1918 preponderated in favor of the Central Powers — the land campaigns being strikingly in their favor; while the mastery of the seas and economic resources remained with Great Britain and the other allies.

About the middle of July, 1918, with over a million American troops in France, General Foch made his great counter-offensive, supported by French, British and American forces. From this time forward until the signing of the armistice, on Nov. 11, the tide of war was steadily against the Central Powers.

The following events mark the breaking down of the Central Powers and the consequent triumph of the Entente Allies:

Sept. 25–29. Bulgaria proposed an armistice, and failing that, surrendered. On Oct. 4, King Ferdinand abdicated.

Oct. 27–31. Austria sued for peace and asked for armistice. On Nov. 4, Austria agreed to armistice terms amounting to unconditional surrender.

Oct. 30–31. Turkey is granted an armistice, and surrendered unconditionally on Oct. 31.

Nov. 7. Germany sent to Gen. Foch for armistice terms, and the same were signed on Nov. 11. The Emperor of Germany abdicated on Nov. 9, and fled to Holland.

Nov. 12. Emperor Charles of Austria-Hungary abdicated the throne.

Nov. 17. The Allied Armies of occupation began their march for the German frontier. Marshal Foch occupied Strasbourg, Nov. 25; the American Army entered Germany, Dec. 1; British troops crossed the German frontier from Belgium, Dec. 3. The American Army reached its final objective at Coblenz, on the Rhine, and the British formally occupied Cologne, on Dec. 16.

Nov. 29. Representatives of the United States to the Peace conference at Paris are announced by President Wilson.

Nov. 30. Lithuania was proclaimed a republic.

Dec. 2. King Nicholas of Montenegro was deposed, and his country united with Serbia.

Dec. 4. President Wilson and the other representatives of the United States peace delegation take passage on the *George Washington* from New York for Brest, France, and arrived Dec. 13.

Dec. 6. The Crown Prince of Germany renounced his right to the throne, and took refuge in Holland.

Jan. 12. The Supreme Council of the Peace Congress consisting of President Wilson and the Premiers and Foreign Ministers of Great Britain, France, United States, and Italy, met in Paris for the first formal exchange of views.

Jan. 17. Delegations to the Peace Congress are announced completed, the representatives being as follows: *France* — Premier Clemenceau, Foreign Minister Pichon, Finance Minister Klotz, Andre Tardieu, and Jules Cambon. *Great Britain* — Premier Lloyd George, Foreign Secretary Balfour, Andrew Bonar Law, George Nicoll Barnes, labor leader, and one alternate. *United States* — President Wilson, Secretary Lansing, Henry White, Colonel House and General Bliss. *Italy* — Premier Orlando, Foreign Minister Sonnino, ex-Premier Salandra, Marquis Riggi, and Signor Stringher, Minister of Finance. *Japan* — Ex-Premier Saionji, Baron Makino, Baron Chinda, Baron Matsui, and Count Hayashi. *Brazil* — Senator Possoa, Dr. Calogeras, and Raoul Fernandez. *Belgium* — Paul Hymans, Minister of Foreign Affairs; Emile Vandervelde, and M. Vandenheuvel. *Serbia* — Ex-Premier Pashitch and M. Trumbitch; alternates, Dr. Vesnitch and M. Reber. *Greece* — Premier Venizelos and former Minister Politis. *Roumania* — Premier Bratiano and M. Mishr. *Czecho-Slovakia* — Premier Kramarz and Foreign Secretary Benes. *Poland* — M. Dmowski and General Pilsudski. *China* — Lu Cheng Hsiang, Premier, and one other. *Canada* — Premier Borden and Sir George Foster. *Australia* — Premier Hughes and one other. *South African Republic* — General Botha and General Jan C. Smuts. *India* — The Maharajah of Bikaner and Sir S. P. Sinha. *Siam* — M. Charoon, Minister to France, and one other. *New Zealand* — Premier W. F. Massey. *Portugal* — Ejas Moniz. *Hejaz*, Arabia, two representatives.

Jan. 18. The Peace Congress at Paris, the most significant in the history of the world, began its first session in the great hall of the French Ministry of Foreign Affairs.

GREAT AMERICAN AND FOREIGN BATTLES.

This table includes those battles of decisive or far-reaching importance upon the destinies of the contestants. The dates are according to the Old Style, or Julian, calendar down to 1582; after that date, according to the New Style, or Gregorian, calendar. The victors in the various battles are printed in **bold-face** type. Details of minor American battles will be found in connection with the Outline Tables of American History. †Naval battles; *Indecisive results.

Name of Battle; Approximate Location; Date	Contesting Nations or Parties	Results and Marked Features of the Contest
Abensberg (*ä'bens-berg*), Bavaria, April 20, 1809	**French and Bavarians** vs. Austrians	About 90,000 engaged on each side.
Aboukir (*ä-bōō-kēr'*), **Battle of the Nile,** Egypt, August 1, 1798	**English** vs. French	Nelson cut off Napoleon's return to Europe.
Aboukir, Egypt, July 25, 1799	**French** vs. Turks	Two-thirds of Turkish troops killed.
†**Abydos** (*ä-bī'dos*), Hellespont, B. C. 411	**Athenians** vs. Peloponnesians	
Acragas (*ak'ra-gas*), **Siege of,** Sicily, B. C. 406	**Carthaginians** vs. Greeks	The citizens evacuated the fortress.
Acre (*ä'ker* or *ā'ker*), **Siege of,** Syria, 1189-1191	**Christians** vs. Saracens	Richard the Lion Hearted won renown by this siege.
Acre, Siege of, Syria, March 17, 1799	**Turks** vs. French	
†**Actium** (*ak'shi-um*), Greece, September 2, B. C. 31	**Augustus** vs. Antony	At the critical moment Antony and Cleopatra sail away.
Adowa (*ä'dō-wä*), Northeast Africa, March 1, 1896	**Ethiopians** vs. Italians	Italians routed with enormous loss.
Adrianople (*ad-ri-an-ō'pl*), Thrace, July 3, 323	**Constantine** vs. Licinius	Constantine gained empire.
Adrianople, Thrace, 378	**Visigoths** vs. Romans	Emperor Valens defeated and slain.
Adwalton (*ad'wal-ton*) **Moor,** England, January 30, 1643	**Royalists** vs. Parliamentarians	
Ægadian Islands (*ē-gā'di-an*), Sicily, B. C. 241	**Romans** vs. Carthaginians	This victory put an end to the first Punic war.
†**Ægospotami** (*ē-gos-pot'a-mī*), Thrace, B. C. 405	**Spartans** vs. Athenians	Virtually ended Peloponnesian war.
Aghrim (*ō'grim*), Ireland, July 12, 1691	**William III.** vs. James II	Irish savagely slaughtered.
Agincourt (*ä-zhan-kōōr*; E. *aj'in-kōrt*), France, October 25, 1415	**English** vs. French	Great victory for Henry V.
Agnadello (*ä-nyä-del'lō*), Italy, May 14, 1509	**French** vs. Venetians	One of the most disastrous battles in the history of Venice.
Agrigentum (*ag-ri-jen'tum*), **Siege of,** Sicily, B. C. 262	**Romans** vs. Carthaginians	
Alamo (*ä'lä-mō*), **Storming of the,** Texas, U. S., February 22, 1836	**Mexicans** vs. Texans	Survivors put to the sword.
Albuera (*äl-bwā'rä*), Spain, May 16, 1811	**British** vs. French	Heavy losses on both sides.
Aleppo (*ä-lep'ō*), Syria, 638	**Moslems** vs. Syrians	Last serious resistance in Syria to the invading Moslems.
Alexandria (*ä-leks-än'dri-ä*), **Siege of,** Egypt, 638	**Moslems** vs. Egyptians	Left Moslems masters of Egypt.
Alexandria, Bombardment of, Egypt, July 11-12, 1882	**English** vs. Arabi Pasha	Forts totally destroyed. English occupy Egypt.
Algiers (*al-jērz'*), **Bombardment of,** Algeria, 1816	**English and Dutch** vs. Dey of Algeria	Dey agreed to total abolition of Christian slavery in his dominion.
Allia (*al'i-ä*), Italy, B. C. 390	**Brennus and his Gauls** vs. Romans	Rome left defenseless.
Alma (*äl'ma*), Crimea, September 20, 1854	**English and French** vs. Russians	British carried heights at the point of the bayonet.
Almansa (*äl-män'sä*), Spain, April 25, 1707	**French** vs. British and Portuguese	Spain lost to the allies.
Amphipolis (*am-fip'ō-lis*), **Siege of,** Thrace, B. C. 422	**Spartans** vs. Athenians	Both Brasidas and Cleon fell.
Anaquito (*ä-nä-kē'tō*), Peru, 1546	**Pizarro** vs. Viceroy Menez	Government of Peru fell into Pizarro's hands.
Angora (*an-gō'rä*), Asia Minor, 1402	**Tartars** vs. Turks	Tamerlane said to have had eight hundred thousand men.
Antietam (*an-tē'tam*), Maryland, U. S., September 17, 1862	***Confederates** vs. U. S.	Heavy losses on both sides. Lee's army greatly outnumbered.
Antioch, Siege of, Syria, 1097-1098	**Crusaders** vs. Saracens	Defenders massacred.
Antwerp (*ant'wirp*), Belgium, 1576	**Spaniards** vs. Walloons	Massacre of inhabitants known as the "Spanish Fury."
Appomattox (*ap-pō-mat'oks*), Virginia, U. S., April 9, 1865	**U. S.** vs. Confederates	Marked the close of the American Civil war, and surrender of General Lee.
Aquae Sextiae (*ä'kwe seks'ti-ē*), Gaul, B. C. 102	**Romans** vs. Teutons	Caius Marius annihilates the barbarian army.
Arbela (*är-bē'lä*), Persia, B. C. 331	**Macedonians** vs. Persians	This victory made Alexander master of Asia.
Arcola (*är'kō-lä*), Italy, November 15-17, 1796	**French under Napoleon** vs. Austrians	Napoleon prevented the junction of two Austrian armies.
Arcot (*är-kot'*), **Siege of,** India, August 31-November 15, 1751	**English and Sepoys** vs. French	Robert Clive held out ten weeks against a far superior force before being relieved.
†**Arginusae** (*är-ji-nū'sē*), Asia Minor, B. C. 406	**Athenians** vs. Peloponnesians	Command of the sea temporarily restored to Athens.
†**Armada** (*är-mä'dä*), **The Invincible,** English Channel, July, 1588	**English** vs. Spanish	Beginning of English sea-power.
Arsuf (*ar-suf*), Syria, September 7, 1191	**English Crusaders** vs. Saracens	Great victory of Richard the Lion Hearted over Saladin.
†**Artemisium** (*är-te-mish'um*), Eubœa, B. C. 480	***Persians** vs. Greeks	Fought at the same time as the battle of Thermopylæ.

GREAT AMERICAN AND FOREIGN BATTLES—Continued

Name of Battle, Approximate Location, Date	Contesting Nations or Parties	Results and Marked Features of the Contest
Ascalon (*as'ka-lon*), Syria, 1099	**Crusaders** vs. Saracens	Moslem resistance to Christians ended for a time.
Asculum (*as'ku-lum*), Italy, B.C.279	**Pyrrhus** vs. Romans	Pyrrhus, though victorious, suffered great loss.
Aspern (*ăs'pern*), Austria, May 21-22, 1809	***Austrians** vs. French	Napoleon retired. Each side lost about 20,000 men.
Assaye (*ă-sī'*), India, September 23, 1803	**English** vs. East Indians	Sir Arthur Wellesley (later duke of Wellington) defeated forces almost ten times as numerous.
Austerlitz (*ous'ter-lits*), Austria, December 2, 1805	**French** vs. Russians, Austrians	The Battle of the Three Emperors: Napoleon, Alexander I., Francis I.
†**Azores** (*ā-zōrz'*), Atlantic Ocean, 1591	**Spanish** vs. English	Gallant fight made by Sir Richard Grenville in the *Revenge*.
Balaclava (*băl-ă-klä'vä*), Crimea, October 25, 1854	**Russians** vs. English	"Charge of the Light Brigade" celebrated by Tennyson.
Bannockburn (*ban'ok-burn*), Scotland, June 24, 1314	**Scots** vs. English	Bruce drives back English invaders with great slaughter.
Barnet (*bär'net*), England, April 4, 1471	**Yorkists** vs. Lancastrians	Earl of Warwick ("Kingmaker") slain.
Bautzen (*bout'sen*), Germany, May 20-21, 1813	**French** vs. Prussians, Russians	The allies lost 15,000 killed and wounded.
†**Beachy Head,** England, June 30, 1690	**French** vs. English, Dutch	The French had been sent to create a diversion in favor of James II. in Ireland.
Belgrade (*bel-grăd'*), **Siege of,** Servia, April, 1456	**Hungarians** vs. Turks	John Hunyady's last exploit.
Beneventum (*ben-e-ven'tum*), Italy, B. C. 275	**Romans** vs. Pyrrhus	Pyrrhus' last serious attack against the Romans.
Beresina (*ber-yā'zē-nä*), **Crossing of the,** Russia, November 28, 1812	**Russians** vs. French	A most terrible disaster on the retreat from Moscow.
Bergen-op-Zoom (*berch'en-op-zōm'*) **Siege of,** Netherlands, 1747	**French** vs. English, Dutch	French lost heavily in this siege.
Bibracte (*bi-brak'tē*), Gaul, B. C. 58	**Romans** vs. Helvetians	A defeat would have meant destruction to Cæsar.
Blenheim (*blen'im*), Bavaria, August 13, 1704	**British and Imperialists** vs. French and Bavarians	Brilliant victory of Marlborough and Prince Eugene.
Borodino (*bor-o-dyē-nō'*) commonly Anglicized, *bor-ō-dē'nō*)	***French** vs. Russians	One of the most bloody battles on record.
Bosworth Field, England, August, 1845	**Lancastrians** vs. Yorkists	Richard III. slain; Henry Tudor becomes Henry VII. of England.
Bouvines (*bō-vēn'*), Flanders, 1214	**French** vs. Flemish, English and Germans	Secures the position of Philip Augustus on the throne of France.
Bovianum (*bō-vi-ā'num*), **Siege of,** Italy, B. C. 305	**Romans** vs. Samnites	End of second Samnite war.
Boyne (*boin*) **river,** Ireland, July 1, 1690	**William III.** vs. James II.	Irish under James II. totally defeated.
Breitenfeld (*brīt'en-felt*), Germany, September 7, 1631	**Swedes and Saxons** vs. Imperialists	Brilliant victory of Gustavus Adolphus over Tilly.
Breitenfeld, Germany, 1642	**Swedes** vs. Imperialists	Victory of Tortenson over Piccolomini.
Brill, Seizure of, Holland, 1572	**Netherlanders** vs. Spanish	The first success of the Netherlanders.
Buena Vista (*bwä'nä vēs'tä*), Mexico, February 22-23, 1847	**Americans** vs. Mexicans	General Zachary Taylor victorious over much larger force.
Bull Run, Virginia, U. S. A., July 21, 1861	**Confederates** vs. Federals	The first important battle of the Civil war.
Bunker's Hill, Massachusetts, U. S. A., June 17, 1775	**British** vs. Americans	Though dislodged from their position, the Americans won a practical victory.
Byzantium (*bi-zan'shi-um*), **Siege of,** Thrace, 323	**Constantine** vs. Licinius	Byzantium refounded as Constantinople, the capital of the empire.
†**Cadiz** (*kā'diz*, Sp. *kä'dēth*), Spain, 1587	**English** vs. Spanish	Here Drake "singed the King of Spain's beard."
Calais (Fr. *kä-lā'*), **Siege of,** France, 1346-1347	**English** vs. **French**	Calais remained in English possession until 1558.
†**Camperdown** (*kam-per-doun'*), Holland, October 11, 1797	**British** vs. Dutch	The Dutch fleet, allied with France, was practically destroyed.
Cannæ (*kan'ē*), Italy, B. C. 216	**Carthaginians** vs. Romans	Hannibal inflicts one of the most disastrous defeats the Romans ever suffered.
†**Cape St. Vincent,** Portugal, February 14, 1797	**British** vs. Spanish	Spanish fleet, allied with France, beaten bv Admiral Jervis.
Capua (*kap'ū-a;* It. *kä'pōō-ä*), **Siege of,** Italy, B. C. 211	**Romans** vs. Capuans and Carthaginians	Hannibal was unable to break through Roman lines and relieve the city.
Carrhæ (*kar'ē*), Mesopotamia, B. C. 53	**Parthians** vs. Romans	Crassus, one of the triumvirs, defeated and shortly after slain.
Carthage (*kär'thij*), **Siege of,** North Africa, B. C. 146	**Romans** vs. Carthaginians	Carthage razed to the ground.
Castillon (*käs-te-yōn'*), France, July 17, 1453	**French** vs. English	This victory ended the Hundred Years' war.
†**Catana** (*kä-tän'ä*), Sicily, B. C. 387	**Carthaginians** vs. Syracusans	Syracusans utterly routed. Carthaginians besieged Syracuse.
Caudine (*kä'din*) **Forks,** Italy, B. C. 321	**Samnites** vs. Romans	The whole Roman army was "sent under the yoke."
Cawnpore (*kän'pōr*), India, December 6, 1857	**British** vs. Mutineers	Sir Colin Campbell routs mutineers.
Chæronea (*ker-ō-nē'ä*), Greece, B. C. 338	**Macedonians** vs. Athenians and Thebans	Philip of Macedon wins hegemony of Greece.
Chalons (*shä-lōn'*), France, 451	**Romans and Visigoths** vs. Huns	Attila retreated and western Europe was saved from the Huns.
Chattanooga (*chat-ä-nōō'gä*), Georgia, U.S. A., November 24-27, 1863	**Federals** vs. Confederates	The "Battle above the Clouds" fought on Lookout Mountain.

GREAT AMERICAN AND FOREIGN BATTLES—Continued

Name of Battle, Approximate Location, Date	Contesting Nations or Parties	Results and Marked Features of the Contest
Chickamauga (*chik-ȧ-mô'-gȧ*), Tennessee, U. S. A., Sept. 19-20, 1863.	**Confederates** vs. Federals	Federal losses 16,000; Confederate about 12,000.
Chioggia (*kyod'jä*), **Blockade of,** Venetia, January to June, 1380	**Venetians** vs. Genoese	Loss of this city broke the power of the Genoese republic for many years.
Chotusitz (*chô'tô-zits*) (**Caslau**), Bohemia, May 17, 1742	**Prussians** vs. Austrians	This victory led Austria to sign the peace of Breslau, June 11, 1742.
Clusium (*klōō'shi-um*), Italy, B. C. 225	**Gauls** vs. Romans	Romans said to have lost 25,000.
†**Cnidus** (*nī'dus*), Asia Minor, B. C. 394	**Athenians and Persians** vs. Spartans	Sparta lost her recently gained maritime ascendency.
Colenso (*kō-len'sō*), South Africa, December 15, 1899	**Boers** vs. British	First action in Buller's campaign for the relief of Ladysmith.
Colline (*kol'in*) **Gate,** Rome, B.C. 82.	**Optimates** vs. Democrates and Samnites	Sulla's victory ended the Roman civil war.
†**Constantinople** (*kon-stan-nō'pl*), **Siege of,** Thrace, 1204	**Crusaders and Venetians** vs. Greek Empire	Baldwin of Flanders becomes Latin emperor of the East.
Constantinople, Siege of, Thrace, April 26-May 29, 1453	**Turks** vs. Greeks	Final overthrow of Greek Empire.
Copenhagen (*kō-pen-hā'gen*), **Bombardment of,** Denmark, 1807	**British** vs. Danish	England forces surrender of Danish fleet to save it from Napoleon.
Coronea (*kor-ō-nē'ȧ*), Greece, B. C. 394	**Sparta** vs. Thebes, Corinth, Argos and Athens	Agesilaus, Spartan king, compelled to evacuate Bœotia.
Corunna (*kō-run'ȧ*), Spain, January 16, 1809	**British** vs. French	Sir John Moore killed. French kept at bay while British embarked.
Courtrai (*kōōr-trā'*), Flanders, July 11, 1302	**Flemish** vs. French	"Battle of the Spurs." Great carnage among French knighthood.
Crécy (*krā'sē*), France, August 26, 1346	**English** vs. French	Victory due to English archers.
Crimisus (*kri-mī'sus*), **the river,** Sicily, B. C. 340	**Sicilians** vs. Carthaginians	Secured Greek towns of Sicily peace for many years.
Culloden (*ku-lō'den* or *-lod'en*), Scotland, April 16, 1746	**British** vs. Scots under Young Pretender	Last attempt of the Stuarts to recover British throne.
Cunaxa (*kū-nak'sȧ*), Babylonia, B. C. 401	**Cyrus and the "Ten Thousand"** vs. Persians	Cyrus was slain and the Greeks made the "Anabasis" to the sea.
Custozza (*kōs-tōd'zȧ*), Italy, June 24, 1866	**Austrians** vs. Italians	Though defeated, the Italians gained Venetia through Prussia.
Cynoscephalae (*sī-nō-sef'ȧ-lē* or *sin-ō*), Greece, B. C. 197	**Romans** vs. Macedonians	Philip V. forced to abandon the hegemony of Greece.
†**Cyzicus** (*siz'i-kus*), Propontis, B. C. 410	**Athenians** vs. **Peloponnesians**	Alcibiades surprised and practically annihilated the Peloponnesian fleet.
Dardanelles (*där-dȧ-nelz'*) **Campaign,** Turkey, March 18, 1915, to January 9, 1916	**Turks** vs. British and French	British and French withdrew after a loss of 115,000, killed, wounded or prisoners.
Delhi (*del'i*), **Siege of,** India, June 8 to September 20, 1857	**British** vs. Mutineers	Delhi was the real center of the Indian mutiny.
Delium (*dē'li-um*), Greece, B. C. 424.	**Bœotians** vs. Athenians	Decisive and disastrous defeat for Athenians.
Dennewitz (*den'ne-vits*), Germany, September 6, 1813	**Russians, Prussians, Austrians and Swedes, Allies,** vs. French	Victory of Bernadotte (afterward Charles XIV. of Sweden) over Ney.
Deorham (*de-or'hăm*), England, 577.	**West Saxons** vs. Welsh	Wessex extended to Bristol channel, severing Welsh into two parts.
Dessau (*des'ou*), Germany, 1626	**Imperialists** vs. Protestants	Wallenstein totally routed Mansfeld.
Dettingen (*det'ing-en*), Germany, June 27, 1743	**British** vs. French	Last battle in which a British sovereign engaged in person.
Douro (*dō'rōō*, Span. *dwā'rō*) **the river,** Portugal, May 12, 1809	**British** vs. French	French driven out of Oporto.
†**Downs, The,** North Sea, June 11-14, 1666	***Dutch** vs. English	English fleet took shelter in the Thames; Dutch too crippled to pursue.
Drepana (*drep'a-nȧ*), Sicily, B. C. 249.	**Carthaginians** vs. Romans	This and other defeats led Romans to abandon the sea temporarily.
Dresden (*drez'den;* Ger. *drās'den*), Germany, August 26, 27, 1813	**French** vs. Russians, Prussians and Austrians	Napoleon's last great victory on German soil.
Drogheda (*drô'he-dȧ* or *drô'e-dȧ*), **Storm of,** Ireland, Sept. 12, 1649	**British and Parliamentarians** vs. Royalists	Cromwell put the garrison to the sword.
Dunbar (*dun-bär'*), Scotland, Sept. 3, 1650	**Parliamentarians** vs. Scottish Royalists	Cromwell's victory followed by the surrender of Edinburgh and Glasgow.
Ebersberg (*ā'bers-berg*), **Storm of,** Bavaria, May 3, 1809	**French** vs. Austrians	A horrible combat in which thousands were burned in the ruined village.
†**Ecnomus** (*ek'no-mus*), Sicily, B. C. 256	**Romans** vs. Carthaginians	Romans laid waste Carthaginian territory in Africa.
Edgehill, England, October 23, 1642.	***Royalists** vs. Parliamentarians	The first battle of the Civil war. Royalists march on London.
El Caney (*el kȧ-nā'*), Cuba, July 1, 1898	**Americans** vs. Spaniards	The chief battle of the war in Cuba.
Ellandun (*el'lan-dŭn*), England, 825.	**West Saxons** vs. Mercians	The West Saxon Egbert becomes overlord of all the English.
Evesham (*ēvz'ham*), England, August 4, 1265	**Prince Edward** vs. Simon de Montfort	This defeat ended the war. Simon de Montfort fell.
Eylau (*ī'lau*), Prussia, February 8, 1807	***Russians and Prussians** vs. French	The bloodiest and most desperate battle of a century.
Falkirk (*fôl'kerk;* Scot., *fô'kerk*), Scotland, July 22, 1298	**English** vs. Scotch	Edward I. utterly routed Wallace.
Fehrbellin (*fär-bel-lēn'*), Brandenburg, June 18, 1675	**Brandenburgers** vs. Swedes	The first great victory of Brandenburg, Prussia.
Flodden (*flod'n*), England, September 9, 1513	**English** vs. Scots	The Scottish king perished, with the bravest of his nobility.
Fontanet (*fŏn-tăn-ā'*), France, June 20, 841	**Louis and Charles** vs. Lothaire (Grandsons of Charlemagne)	Followed by the famous Partition of Verdun (843).

GREAT AMERICAN AND FOREIGN BATTLES—Continued

Name of Battle, Approximate Location, Date	Contesting Nations or Parties	Results and Marked Features of the Contest
Fontenoy (*fŏn-t'-nwä'*), Belgium, May 11, 1745	**French** vs. British, Dutch and Austrians	Last great victory of France under the Old Regime.
Fornovo (*for-no'vō*), Italy, July 6, 1495	**French** vs. Italians	Charles VIII. enabled to continue his retreat following his conquest of Naples.
Friedland (*frēt'länt* or *frēd'länt*), Prussia, June 14, 1807	**French** vs. Russians	This defeat induced the Czar to conclude the peace of Tilsit.
Gettysburg (*get'iz-bûrg*), Pennsylvania, U. S. A., July 1-3, 1863	**Federals** vs. Confederates	One of the bloodiest battles of the war, forcing Lee from northern soil.
Gibraltar (*ji-brâl'tär*), **Siege of,** Spain, 1779-1782	**British** vs. French and Spanish	The last formidable attack upon Gibraltar (British since 1704).
Granada (*grä-nä'dä;* Sp. *grä-nä' thä*), **Capitulation of,** Spain, January 2, 1492	**Spaniards** vs. Moors	Completes the overthrow of the Moorish power in Spain.
Granicus (*grä-ni'kus*) **River,** Asia Minor, B. C. 334	**Alexander the Great** vs. Persians and Greek Mercenaries	Destroyed the only army opposed to Alexander in Asia Minor.
Granson (*gran-sôn'*), Switzerland, March 2, 1476	**Swiss** vs. Burgundians	First of the three great victories of the Swiss over Charles the Bold.
Gravelotte (*gräv-lot'*), Lorraine, August 18, 1870	**Prussians** vs. French	The first great victory of the Prussians in the war.
Guinegate (*gēn-gät'*), France. August 16, 1513	**English and Imperialists** vs. French	Called the "Battle of the Spurs" from the French haste in flight.
Haarlem (*här'lem*), **Siege of,** Holland, Dec. 9-July 14, 1572-1573	**Spaniards** vs. Dutch	30,000 Spaniards against 4,000 Dutch; 2,000 Dutch massacred.
Halidon (*hal'i-dn*) **Hill,** England, July 19, 1333	**Edward III. of England** vs. Scots	Won by combination of archers and dismounted men-at-arms.
†**Hampton** (*hamp'tn*) **Roads,** Virginia, U. S. A., March 8, 1862	**Monitor (Federal)** vs. Merrimac (Confederate)	After this wooden ships give way to ironclads in naval warfare.
Hastenbeck, Germany, July 26, 1757.	**French** vs. Hanoverians	Followed by the convention of Closter-Zeven, which George II. repudiated.
Hastings (*hās'tingz*), England, October 14, 1066	**Normans** vs. English	Harold fell; William the Conqueror became king of England.
Heraclea (*her-ä-klē'ä* or *-klī'ä*), Italy, B. C. 280	**King Pyrrhus** vs. Romans	"One more such victory and I shall be ruined."—Pyrrhus.
Hexham (*hek'sam*), England, May 15, 1464	**Yorkists** vs. Lancastrians	The Lancastrian cause was completely crushed by this defeat.
Himera (*him'er-ä*), Sicily, B. C. 480.	**Syracuse and Agrigentum** vs. Carthaginians	Hamilcar slain. Carthaginians purchased peace for 2,000 talents.
Himera, Siege of, Sicily, B. C. 409.	**Carthaginians** vs. Silician Greeks	Town sacked and prisoners sacrificed to the shade of Hamilcar.
Höchst (*hûkst*), Germany, June 20, 1622	**Imperialists** vs. Palatinate troops	Practically ends the Bohemian-Palatinate phase of the Thirty Years' war.
Hohenfriedburg (*hō'ēn-frēd'berg*), Germany, June, 1745	**Prussians** vs. Austrians and Saxons	One of Frederick the Great's victories; due partly to Austrian overconfidence.
Hohenlinden (*hō-en-lin'den*), Bavaria, December 3, 1800	**French** vs. Austrians	The crowning event of the winter campaign; won by Moreau.
Hohkirchen (*hō'kirch-en*), Germany, October 14, 1758	**Austrians** vs. Prussians	Frederick the Great, though surprised by a night attack, made good his retreat.
Homildon (*hom'l-dn*) **Hill,** England, September 14, 1402	**English** vs. Scots	Another great victory due to the prowess of the English longbowmen.
Hydaspes (*hī-das'pēz*) **River,** India, B. C. 326	**Greeks** vs. Asiatics	The last important battle in the eastward advance of Alexander the Great.
Inkermann (*ing-ker-män'*), Crimea, November 5, 1854	**British and French** vs. Russians	A series of hand-to-hand combats fought in a dense fog.
Inverlochy (*in-ver-lock'i*), Scotland, February 2, 1645	**Royalist Highlanders** vs. Campbells and Lowland Covenanters	Power of the Campbells in the Highlands broken for many years.
Ipsus (*ip'sus*), Asia Minor, B. C. 301.	**Seleucus** vs. Antigonus	Chief battle between Alexander's generals over the partition of his empire.
Issus (*is'us*), Asia Minor, B. C. 333.	**Macedonians** vs. Asiatics	Alexander's brilliant victory over an immense horde of Persians.
Ivry (*ēv-rē'*), France, March 14, 1590.	**Huguenots** vs. Catholics	Henry IV. gained a complete victory and invested Paris, his capital.
Jarnac (*zhär-näk'*), France, March 13, 1569	**Catholics** vs. Huguenots	Prince de Condé slain.
Jemmapes (*zhe-mäk'*), Belgium, November 6, 1792	**French** vs. Austrians	Followed by annexation of the Austrian Netherlands to France.
Jena (*yä'nä*), Germany, October 14, 1806	**French** vs. Prussians	Napoleon advanced thence to Berlin and issued the decree for a continental blockade.
Jerusalem (*jē-rōō'sä-lem*), **Siege of,** Syria. 70	**Jews** vs. Romans	Titus destroyed the city and massacred or sold into slavery its inhabitants.
Jerusalem, Storm of, Syria, July 15. 1099	**Crusaders** vs. Moslems	A terrible massacre; feudal kingdom established under Godfrey of Bouillon.
†**Jutland,** Baltic Sea, May 31, 1916.	**Germans** vs. British	British admitted the loss of six large cruisers and eight destroyers, the Germans a battleship, a cruiser, four light cruisers and five destroyers. The loss of life totaled 9,500 and the battle ended with the withdrawal of the German fleet.
Kappel (*käp'pel*), Switzerland, October 11, 1531	**Swiss Catholic Cantons** vs. Zurichers	Zwingli, the Swiss Protestant reformer, fell in this battle.
Kars (*kärs*), **Storm of,** Armenia, November 17-18, 1877	**Russians** vs. Turks	Russian success caused angry negotiations between England and Russia.
Katzbach (*käts'bak*), Germany, August 26, 1813	**Prussians** vs. French	A decisive victory of Blücher over one of Napoleon's marshals.
Khartoum (*kär-tōm'*), **Siege of,** Soudan, March 12-January 26, 1884-1885.	**Mahdi** vs. Gordon	"Chinese" Gordon killed; the Soudan evacuated by the Anglo-Egyptian government.

GREAT AMERICAN AND FOREIGN BATTLES—Continued

Name of Battle, Approximate Location, Date	Contesting Nations or Parties	Results and Marked Features of the Contest
Killiecrankie (*kil-i-krang'ki*), Scotland, July 17, 1689	**Highland Jacobites** vs. Royalists	The Jacobite victory was nullified by the fall of their leader, Dundee.
Kimberley (*kim'ber-li*), **Siege of,** South Africa, October 15, 1899 to February 15, 1900	**British** vs. Boers	The brilliant defense of Kimberley was a notable feature of the war.
Kin-chau (*kin-chow'*), Manchuria, May 26, 1904	**Japanese** vs. Russians	General Oku opened the way for the land investment of Port Arthur.
Koniggrätz (*kû'nich-gräts'*), **(or Sadowa),** Germany, July 3, 1866	**Prussians** vs. Austrians	This victory gave the supremacy in Germany to Prussia, unity to North Germany.
Kolin (*kō-lēn'*), Bohemia, June 18, 1757	**Austrians** vs. Prussians	Following this defeat, Frederick the Great evacuated Bohemia.
Kossova (*kos'ō-vō*), Servia, June 15, 1389	**Turks** vs. Christian Slavs	A battle famed in the history, legend and literature of Servia.
Kossova, Servia, October 17-19, 1448	**Turks** vs. Christians	The hero, John Hunyady, overcome at the cost of 40,000 Turkish lives.
Kotzim (*cho-tem'*), Russia, November 11, 1673	**Poles** vs. Turks	John Sobieski, by sheer personal ascendency, stems tide of Turkish advance.
Kulm (*kōōlm*), Germany, August 29-30, 1813	**Austrians, Russians and Prussians** vs. Napoleon	7,000 French capitulate; "The Caudine Forks of modern war." Conduces to the defeat at Leipzig.
Kunersdorf (*kōō'ners-dorf*), Germany, August 12, 1759	**Austrians and Russians** vs. Prussians	Inactivity of the allies saved Frederick the Great from annihilation.
†**Lade** (*lä'dē*), Asia Minor, B. C. 494.	**Persians** vs. Ionian Greeks	This defeat put an end to the Ionian revolt.
Ladysmith (*lā'di-smith*), **Siege of,** South Africa, November 2, 1899 to February, 1900	**British** vs. Boers	Like the siege of Kimberley, a notable incident of the war.
†**La Hogue** (*lä hōg*), Northwestern France, May 19-20, 1692	**English and Dutch** vs. French.	Overthrew the hopes of James II. of recovering his throne.
†**Lake Erie,** Lake Erie, September 10, 1813	**Americans** vs. British	"We have met the enemy and they are ours."—Perry.
†**La Rochelle** (*lä rō-shel'*), France, June 22-23, 1372	**French and Spaniards** vs. English	Control of the sea passes for a time to the side of the French.
La Rochelle, Siege of, France, November 1, 1627 to October 28, 1628.	**Richelieu** vs. Huguenots and English	Huguenots no longer an armed political party but a tolerated sect.
Lechfeld (*lech'feld*), Germany, August 10, 955	**Otto I.** vs. Hungarians	A crushing defeat inflicted on the waning power of the Hungarians.
Lech (*lech*), **the river,** Germany, April 15, 1632	**Gustavus Adolphus** vs. German Catholic League	Tilly mortally wounded.
Legnano (*len-yä'nō*), Italy, May 29, 1176	**Lombard League** vs. Frederick Barbarossa	In the peace of Constance (1183), Frederick renounced all regal privileges over the cities.
Leipzig (*līp'sik*), Saxony, September 17, 1631	**Swedes and Saxons** vs. Catholic Imperialists	Brilliant victory of Gustavus Adolphus saves Protestant cause.
Leipzig, Saxony, October 16, 18-19, 1813	**Allies** vs. Napoleon	This disaster lost Germany to Napoleon.
Le Mans (*le mon'*), France, January 6-12, 1871	**Prussians** vs. French	French army almost annihilated.
†**Lepanto** (*le-pan'tō*), Gulf of Corinth, October 7, 1751	**Don John of Austria** vs. Turks.	One of the most splendid naval victories ever achieved.
Leuctura (*lūk'tra*), Greece, B.C. 371.	**Thebans** vs. Spartans	Epaminondas' overthrow of Sparta gives Thebes the hegemony in Greece.
Leuthen (*loi'ten*), Germany, December 5, 1757	**Prussians** vs. Austrians	This battle "would alone make Frederick immortal and rank him among the greatest generals."—Napoleon.
Lewes (*lū'is*), England, May 14, 1264.	**Simon de Montfort** vs. Henry III. and Prince Edward	Simon de Montfort's victory followed by Parliament, the first to which borough representatives were called (1265).
Leyden (*lī'den*), **Siege of,** Holland, May 26 to October 3, 1574	**Dutch** vs. Spaniards	Prince of Orange cut the dikes to bring the fleet to the relief of the city.
Liegnitz (*lēch'nits*), Germany, August 15, 1760	**Prussians** vs. Austrians	Frederick prevented the union of the Austrians and Russians.
Ligny (*lēn-yē'*), Belgium, June 16, 1815	**Napoleon** vs. Blücher	Napoleon's last victory; Blücher joined Wellington at Waterloo on the 18th.
Lille (*lēl*), **Siege of,** France, August 12 to October 22, 1708	**Imperialists** vs. French	France now lay open to the advance of the allies.
Lilybæum (*lil-i-bē'um*), **Siege of,** Sicily, B. C. 250-241	**Carthaginians** vs. Romans	One of the most protracted sieges in history, surrendered only with Sicily at close of war.
Linkoping (*lēn'chû-ping*), Sweden, September 25, 1598	**Swedes** vs. Poles under King Sigismund	Led to perpetual hostility between Sweden and Poland in seventeenth century.
†**Lissa** (*lis'a*), Adriatic, July 20, 1866.	**Austrians** vs. Italians	The only battle between ironclads fought in European waters.
Lobositz (*lō'bō-zits*), Bohemia, October 1, 1756	***Prussians** vs. Austrians	18,000 Saxons besieged at Pirna were now forced into the Prussian army.
Lodi (*lō'dē*), **Bridge of,** Italy, May 10, 1796	**Napoleon Bonaparte** vs. Austrians	This success gave the whole of Lombardy to the French.
Loigny-Poupry (*lwän-ye'poo-pree'*), France, December 2, 1870	**Prussians** vs. French	Prevented the French from relieving Orleans.
Louisburg (*lō'ē-berg*), **Siege of,** Canada, June 8 to July 27, 1758	**British** vs. French	Destruction of one of the strongest fortresses in North America.
Lucknow (*luk'nou*), **Siege of,** India, March 19, 1857 to July 1, 1858	**British** vs. Sepoy mutineers	The turning of the tide; next year the mutiny was totally quelled.
Lutter (*löt'ter*), Germany, August 26, 1626	**Catholics and Imperialists** vs. Danes and Protestant Germans.	Christian of Denmark, severely defeated, retires into Holstein and Mecklenburg.
Lützen (*lüt'sen*), Saxony, November 16, 1632	**Swedes and Protestant Germans** vs. Catholics and Imperialists	Gustavus Adolphus slain in winning his third great victory.

GREAT AMERICAN AND FOREIGN BATTLES—Continued

Name of Battle, Approximate Location, Date	Contesting Nations or Parties	Results and Marked Features of the Contest
Lützen, Saxony, May 2, 1813	**Napoleon** vs. Allies	The first battle in the great German War of Liberation.
Luzzara (*löt-sä'rä*), Italy, August 15, 1702	***French** vs. Imperialists	Followed by French ascendency in Italy until 1706.
Macalo (*mäk-ä'lo*), Italy, October 11, 1427	**Venice** vs. Milan	Carmagnola gained a brilliant victory over the famous condottieri, Sforza, Piccinino and Malatesta.
Madras (*mä-dras'*), **Siege of,** India, Dec. 12, 1758 to Feb. 16, 1759	**English** vs. French	Failure to take Madras was a great blow to French power in India.
Maestricht (*mäs'tricht*), **Siege of,** Belgium, March 12 to June 29, 1579.	**Spaniards** vs. Netherlanders	Inhabitants and garrison massacred.
Mafeking (*maf'e-king*), **Siege of,** South Africa, Oct., 1899 to May 17, 1900	**British** vs. Boers	Baden Powell's resistance aroused world-wide enthusiasm.
Magdeburg (*mäg'de-bōōrch*), **Storm of,** Germany, May 20, 1631	**Catholics and Imperialists** vs. inhabitants	The sack of Magdeburg is one of the darkest spots on the pages of history.
Magenta (*mä-jen'tä*), Italy, June 4, 1859	**French and Piedmontese** vs. Austrians	Napoleon III. and Victor Emmanuel entered Milan.
Magnesia (*mag-nē'shä*), Asia Minor, B. C. 190	**Romans** vs. Antiochus the Great.	The kingdom of the Seleucidæ dismembered.
Malaga (*mä'lä-gä*), Spain, May 8 to August 18, 1487	**Spaniards** vs. Moors	The inhabitants were sold into slavery.
†**Malaga,** Spain, August 24, 1704	***English and Dutch** vs. French.	French fleet prevented from uniting with Spanish which was besieging Gibraltar.
Malakoff (*mä-lä'kof*), **Storm of,** Crimea, September 8, 1855	**French** vs. Russians	Loss of this and other earthworks led that night to the evacuation of Sebastopol.
Malo-Jaroslavitz (*mä'lō yä-rō-slä' vets*), Russia, October 24, 1812	***Russians** vs. French	Napoleon was obliged to abandon southerly line of retreat from Moscow.
Malplaquet (*mäl-plä-kä'*), France, September 11, 1709	**British and Imperialists** vs. French	Bloodiest battle of this war; "carnage, not a battle."
†**Manila** (*mä-nil'ä*) **Bay,** Philippines, May 1, 1898	**Americans** vs. Spaniards	Admiral Dewey totally destroyed the Spanish fleet.
Mansurah (*män-sōō'rä*), Egypt, April 8, 1250	***French Crusaders** vs. Saracens.	The last of the great pitched battles of the crusaders. Shortly after Louis IX. was captured and ruinously ransomed.
Mantinela (*man-ti-nē'ä*), Greece, B. C. 418	**Spartans** vs. Athenians and Argives	The Spartans regained their supremacy in Peloponnesus.
Mantineia, Greece, B. C. 362	**Thebans** vs. Spartans	The death of Epaminondas in this battle ends Theban supremacy.
Mantua (*man'tū-ä*), **Siege of,** Italy, June, 1796, to February 2, 1797	**French** vs. Austrians	The close of Napoleon's marvelous first Italian campaign.
Marathon (*mär'ä-thon*), Greece. B.C. 490	**Athenians and Plataeans** vs. Persians	Miltiades' victory causes Persians to abandon their first expedition against Greece.
Mardia (*mär'di-ä*), Thrace, 315	**Licinius** vs. Constantine the Great	Licinius lost all his European territory except Thrace.
Marengo (*mä-reng'gō*), Italy, June 14, 1800	**French** vs. Austrians	Won for Napoleon largely by General Desaix.
Marignano (*ma-rēn-yä'nō*), Italy, September 13, 14, 1515	**French** vs. Swiss	Francis I. reconquered Milan by this brilliant victory.
Marne (*märn*), a river in France, September 5-7, 1914	**Allies** vs. Germans	Germans forced to retreat and capture of Paris averted.
Marsaglia (*mär-säl'yä*), Italy, October 4, 1693	**French** vs. Duke of Savoy	French infantry with bayonets charged the cavalry, a new maneuver.
Marston Moor, England, July 2, 1644	**Parliamentarians** vs. Royalists.	This victory, due to Cromwell's Ironsides, gave the north to parliament.
Maserfield (*mä'ser-feld*), England, 642.	**Mercians** vs. Northumbrians	Mercia becomes a competitor with Northumbria for English hegemony.
Maxen (*mäks'en*), Germany, November 20, 1759	**Austrians** vs. Prussians	The capitulation of Finck with 12,000 Prussian soldiers disastrous to Frederick.
Maypu (*nū'pō*), Chili, April 5, 1818.	**Chilians** vs. Spaniards	Established the independence of Chili.
Medellin (*mā-tnel-yēn'*), Spain, March 28, 1809	**French** vs. Spaniards	Spaniards mercilessly sabered in the pursuit, losing 18,000.
Megalopolis (*meg-ä-lop'ō-lis*), Greece, B. C. 331	**Macedonians** vs. Spartans	Antipater, in absence of Alexander, puts down revolted Spartans in a bloody battle.
Mentana (*men-tä'nä*), Italy, November 3, 1867	**Garibaldians** vs. French and Papal troops	Garibaldians routed after defeating papal forces.
†**Messina** (*mes-sē'nä*), Sicily, September 28, 1282	**Sicilians and Aragonese** vs. French	Charles of Anjou evacuated Sicily, which his descendants never recovered.
Metaurus (*mä-tau'rus*), Italy, B. C. 207	**Romans** vs. Carthaginians	Italy saved by preventing the junction of Hasdrubal with Hannibal.
Metz (*mets*), **Siege of,** Lorraine, August 19 to October 27, 1870	**Prussians** vs. French	The release of the besieging army for service elsewhere was fatal to the French cause.
Milazzo (*mē-lät'sō*), Sicily, July 20, 1860	**Garibaldians** vs. Neapolitans	This completes the expulsion of the Neapolitans from Sicily.
Minden (*min'den*), Prussia, August 1, 1759	**English, Hessians and Hanoverians** vs. French	The French were decisively beaten and driven from Hesse.
Miraflores (*mē-rä-flō'res*), Argentina, January 13 and 15, 1883	**Chilians** vs. Peruvians	Practically ended the war of the Pacific (1879-1884) between Chili, and Bolivia and Peru.
Missolonghi (*mis-ō-long'gē*), **Siege of,** Greece, April 27, 1825 to April 22-23, 1826.	**Turks** vs. Greeks	Greek heroism excited sympathy throughout Europe. (Byron died here, 1824.)
Mitylene (*mit-i-lē'nē*), **Siege of,** Lesbos, B. C. 428-427	**Athenians** vs. Revolted inhabitants	Prisoners killed, walls pulled down, fleet forfeited, annual tribute imposed.

GREAT AMERICAN AND FOREIGN BATTLES—Continued

Name of Battle, Approximate Location, Date	Contesting Nations or Parties	Results and Marked Features of the Contest
Modder (*mod'er*) **River,** South Africa, November 28, 1899	**British** vs. Boers	Lord Methuen drives Cronje from his intrenchments after a fierce fight.
Mohacs (*mō'häch*), Hungary, August 29, 1526	**Turks** vs. Hungarians	"Never was a single battle so disastrous to a people."
Mollwitz (*möl'vitz*), Germany, April 10, 1741	**Prussians** vs. Austrians	Frederick's victory forces Europe to recognize in Prussia a new power.
Montaperti (*mon-tä-per'tē*), Italy, September 4, 1260	**Florentine Ghibellines, Siennese** vs. Guelphs of Florence.	Secured the triumph of the Ghibellines over all Tuscany.
Monterey (*mon-te-rā'*), Mexico, September 21-23, 1846	**Americans** vs. Mexicans	Followed by the occupation of the whole of northern Mexico.
Montreal (*mont-ri-ôl'*), Canada, September 8, 1760	**British** vs. French	Completes the British conquest of Canada from France.
Mook (*mōk*), Holland, April 14, 1574.	**Spaniards** vs. Dutch	The battle terminated in a horrible butchery of the patriot army.
Morgarten (*mōr'gär-ten*), Switzerland, November 15, 1315	**Swiss** vs. Austrians	The first battle fought for Swiss independence.
Mortimer's (*môr'ti-mer*) **Cross,** England, February 2, 1461	**Yorkists** vs. Lancastrians	The Yorkist prince advanced to London and was proclaimed king as Edward IV.
Mukden (*mōōk-den'*), Manchuria, February 24 to March 10, 1905	**Japanese** vs. Russians	Release of Japanese from before Port Arthur enables Oyama to crush Kuropatkin.
Mühlberg (*mül'berg*), Saxony, April 24, 1547	**Charles V. and Prince Maurice** vs. Saxony and Hesse	Maurice in 1552 retrieves his treason to Protestantism by driving Charles V. from Germany.
Muhldorf (*mül'dorf*), Bavaria, September 28, 1322	**Louis of Bavaria** vs. Frederick of Austria	The disputed imperial election, over which this battle was fought, began a new struggle between empire and papacy.
Munda (*mun'dä*), Spain, B. C. 45	**Julius Cæsar** vs. Pompeians	Cæsar's last battle; it put an end to armed resistance.
Muret (*mü-rā'*), France, September 12, 1213	**Crusaders** vs. Albigenses and Aragonese	Practically ends the Albigensian crusade; Toulousean territories pass ultimately to the French crown.
Mycale (*mik'ä-lē*), Asia Minor, B. C. 479	**Greeks** vs. Persians	This battle and that of Platæa end the Persian wars against Greece.
†**Mylæ** (*mī'lē*), Sicily, B. C. 260	**Romans** vs. Carthaginians	First naval victory of Romans; due to boarding bridges.
Näfels (*nä'fels*), Switzerland, April 9, 1388	**Swiss** vs. Austrians	Hapsburgs renounced all feudal claims over the Swiss cantons (1389).
Nancy (*nän-sē'*), Lorraine, January 5, 1477	**Swiss** vs. Charles the Bold	Charles was slain, leaving his motley territories a prey to neighboring princes.
Narva (*när'vä*), Russia, November 30, 1700	**Swedes** vs. Russians	Charles XII. won a brilliant victory over the much larger army of Peter the Great.
Naseby (*näz'bi*), England, June 14, 1645	**Parliamentarians** vs. Royalists.	Complete defeat of Charles I., followed by the general ruin of his cause.
†**Naupactus** (*nô-pak'tus*), Gulf of Corinth, B. C. 429	**Athenians** vs. Peloponnesians	Victory wrested from defeat by the genius of Phormio, the Athenian commander.
†**Navarino** (*nä-vä-rē'nō*), Greece, October 20, 1827	**English, French and Russians** vs. Turks	Destruction of Turkish naval power; Ibrahim retreats from Morea.
Navas de Tolosa (*nä'väs dä-tō-lō'sä*), Spain, July 16, 1212	**Spaniards** vs. Moors	Secured forever the preponderance of Christianity in Spain.
Neerwinden (*när'vin-den*), Belgium, July 24, 1693	**French** vs. English	The French won a brilliant but barren victory over William III.
Neville's (*nev'ilz*) **Cross,** England, October 17, 1346	**English** vs. Scots	Scots crushed at home, while Edward III. was winning Crécy.
New Orleans (*ôr'li-anz*), Louisiana, U. S. A., January 8, 1815	**Americans** vs. British	Owing to slowness of communication, Jackson fought this battle after peace had been made.
Nicæa (*nī-sē'ä*), **Siege of,** Asia Minor, 1097	**Crusaders** vs. Turks	First conquest of crusaders in the East.
Nicopolis (*ni-kop'ō-lis*), Asia Minor, B. C. 66	**Pompey** vs. Mithradates	Mithridates' last fight against the legions of Rome.
Nördlingen (*nerd'ling-en*), Bavaria, September 6, 1634	**Catholics and Imperialists** vs. Swedes and German Protestants	One of the most bloody and decisive battles of the war; followed by the peace of Prague.
Northampton (*nôrth-amp'tn*), England, July 10, 1460	**Yorkists** vs. Lancastrians	Capture of Henry VI.; flight of Queen Margaret and her son to Scotland.
Numantia (*nū-man'shi-ä*), **Siege of,** Spain, B. C. 142-133	**Romans** vs. Celtiberian tribes	City razed by Scipio Æmilianus and its inhabitants sold as slaves.
Obligado (*ōb-lē-gä'thō*), **Bombardment of,** Argentina, Nov. 28, 1845.	**British and French** vs. Argentines	Over the opening the waters of the Parana to the shipping of all nations.
Olmutz (*ol'müts*), **Siege of,** Moravia, May 27 to July 1, 1758	**Austrians** vs. Prussians	General Daun forced Frederick the Great to raise the siege and retire.
Orleans (*or-lā-än'*; Eng. *ôr'li-anz*), **Siege of,** France, October 13, 1428, to May 8, 1429	**French** vs. English	Joan of Arc saves France by driving back English and crowns Charles VII. at Rheims.
Ostend (*ost-end'*), **Siege of,** Belgium, July, 1601 to September, 1604	**Spaniards** vs. Dutch garrison and inhabitants	Scarcely a house in the town left standing; Spaniards lost 70,000.
Ostrolenka (*os-tro-leng'kä*), Poland, May 26, 1831	**Russians** vs. Poles	Poland becomes a province of the Russian Empire (1832).
Otterburn (*ot'er-bûrn*), England, August 10, 1388	**Scots** vs. English	The ballad of Chevy Chase deals with this battle.
Otumba (*ō-tōm'bä*), Mexico, July 8, 1520	**Cortez** vs. Aztecs	Two hundred Spanish horsemen rout an immense army and make good their retreat.
Oudenarde (*ou-de-när'de*), Belgium, July 11, 1708	**English and Imperialists** vs. French	One of the great victories of Marlborough and Prince Eugene over Louis XIV.
Palmyra (*pal-mī'rä*), **Siege of,** Syria, 272-273	**Romans** vs. Queen Zenobia	Palmyra destroyed and Zenobia taken captive to Rome.

GREAT AMERICAN AND FOREIGN BATTLES—Continued

Name of Battle, Approximate Location, Date	Contesting Nations or Parties	Results and Marked Features of the Contest
Palo Alto (*pä'lō-äl'tō*), Mexico, May 8, 1846	**Americans** vs. Mexicans	Mexicans completely routed at small cost to the victors.
Panormus (*pa-nôr'mus*), Sicily, B.C. 251	**Romans** vs. Carthaginians	Brilliant victory restored confidence to Romans; demonstrated value of elephants in warfare.
Paris (*par'is*), **Siege of,** France, Sept. 19, 1870 to Jan. 28, 1871	**Prussians** vs. French	City reduced to desperate conditions through bombardment, famine and disease.
Pavia (*pä-vē'ä*), Italy, 1525	**Emperor Charles V.** vs. Francis I. of France	The capture of Francis was followed by the peace of Madrid, which, however, was soon repudiated.
Pharsalus (*fär-sā'lus*), Greece, B. C. 48	**Cæsar** vs. Pompey	The West and the new monarchy completely triumphed over the East and the old republic.
Philippi (*fi-lip'ī*), Thrace, B. C. 42.	**Antony and Octavius** vs. Brutus and Cassius	Cassius and Brutus committed suicide following their defeat.
Pinkie (*ping'ki*), Scotland, September 10, 1547	**English** vs. Scots	Scots thrown into the arms of France and the little queen, Mary, married to the dauphin.
Plassey (*plās'ē*), India, June 23, 1757	**English** vs. Bengalese	Established English control in Bengal and ultimately in all India.
Platæa (*pla-tē'ä*), Greece, B. C. 479.	**Greeks** vs. Persians	Won by the discipline and prowess of the Spartan hoplites.
Plevna (*plev'nä*), **Siege of,** Bulgaria, July 16 to December 10, 1877	**Russians** vs. Turks	Brilliant defense by Osman Pasha, who surrendered only after four desperate battles.
Poitiers (*pwä-tyā'*), France, September 19, 1356	**English** vs. French	Brilliant victory by the Black Prince over five times his numbers.
Pollentia (*po-len'shi-ä*), Italy, April 6, 402	**Romans** vs. Visigoths	Alaric, attacked by Stilicho on Easter Sunday, was driven out of Italy.
Pondicherry (*pon-di-sher'i*). **Siege of,** India, Aug., 1760 to Jan., 18, 1761.	**English** vs. French	Destroyed French power in India.
Port Arthur, Siege of, Manchuria, Feb. 8, 1904 to Jan. 1, 1905	**Japanese** vs. Russians	Port Arthur, the Sea of Japan and Mukden were turning points in the war.
†**Portland,** English Channel, February 18-20, 1653	**English** vs. Dutch	This battle completely restored to England the lordship of the seas.
Potidæa (*pot-i-dē'ä*), **Siege of,** Thrace, B. C. 432, September 430.	**Athenians** vs. Potidæans and Corinthians	Inhabitants and foreign soldiers were allowed to leave the city, which Athens then colonized.
Prague (*prāg*), (**White Hill**), Bohemia, November 8, 1620	**Catholic League** vs. Frederick V. and Bohemian rebels	Frederick proved but a "Winter King" of Bohemia.
Preston (*pres'tun*), England, August 17-19, 1648	**Cromwellians** vs. Scottish Royalists	This second civil war determined the army to put Charles I. to death.
Pultava (*pōl'tä-vä*), Russia, July 8, 1709	**Russians** vs. Swedes	Russia takes the place of Sweden as the leading power of the North.
Pydna (*pid'nä*), Macedonia, B.C.168.	**Romans** vs. Macedonians	Brilliant triumphs of Paulus Æmilius over the phalanxes of King Perseus.
Pyramids, Egypt, July 21, 1798	**French** vs. Mamelukes	The crowning victory of Napoleon in Egypt.
Pyrenees (*pir'a-nēz*), **Battles of,** Spain, July 25 to August 1, 1813	**British and Spaniards** vs. French	Followed by the fall of San Sebastian and Pampeluna, and expulsion of French from Spain.
Quatre Bras (*kätr-brä'*), Belgium, June 16, 1815	**British and Allies** vs. French	The allied success here was rendered fruitless by the Prussian reverse at Ligny.
Quebec (*kwē-bek'*; locally often *ki-bek'*), **Siege of,** Canada, June to September 18, 1759	**British** vs. French	Wolfe was slain and Montcalm mortally wounded in the battle of the Plains of Abraham (September 13).
†**Quiberon** (*kē-brôn*) **Bay,** France, November 20, 1759	**British** vs. French	Hawke, with a loss of forty men, captured, burned, or drove on shore most of the French vessels.
Ramillies (*rä-mē-yē'*), Belgium, May 23, 1706	**English and Allies** vs. French	Followed by French evacuation of the chief towns of the Netherlands.
Rhe (*rä*), **Siege of,** France, July 20 to November 8, 1627	**French** vs. English	An attempt of Buckingham to prevent the reduction of the Huguenot stronghold of La Rochelle.
Rhodes (*rōdz*), or **Rhodos** (*rō'dos*). **Siege of,** Mediterranean, July 28-December 26, 1522	**Turks** vs. Knights of Rhodes	Following the loss of Rhodes the Knights (Hospitallers) retired to Malta.
Rieti (*ri-ä'tē*), Italy, March 7, 1821	**Austrians** vs. Neopolitan rebels.	The defeat of General Pepe enabled Austria to restore the absolute monarchy.
Rivoli (*rē'vō-lē*), Italy, January 14-15, 1797	**French** vs. Austrians	Napoleon's victory, followed by surrender of Mantua, completed the conquest of Lombardy.
Rocroi (*rō-krwä'*), France, May 19 1643	**French** vs. Spaniards	This victory, won by Condé, made France the first military power of Europe.
Rome, Sack of, Italy, B. C. 390	**Gauls**	Following the battle of the Allia, the Gauls plundered and destroyed city.
Rome, Sieges of, Italy, 408, 409, 410.	**Visigoths** vs. Romans	Following the third siege, Alaric sacked city.
Rome, Sack of, Italy, 455	**Vandals**	For fourteen days Genseric's Vandals plundered Rome.
Rome, Storm of, Italy, May 6, 1527.	**Mutinous Army of Charles V.** vs. Papal troops	Marks the end of the artistic, pleasure-loving Rome of the Renaissance.
Rome, Siege of, Italy, June 4 to July 3, 1849	**French and Papalists** vs. Roman Republicans	The republic, founded by Mazzini, overthrown and Pope Pius IX. restored.
Roncesvalles (*rōn-thes-väl'yes*), Spain, 778	**Basques** vs. Franks	Death of Charlemagne's paladin, Roland (Chanson de Roland).

GREAT AMERICAN AND FOREIGN BATTLES—Continued

Name of Battle, Approximate Location, Date	Contesting Nations or Parties	Results and Marked Features of the Contest
Roosebek (*rōs'bek*), Flanders, November 27, 1382	**French** vs. Flemings	A great triumph for the nobles against the cities.
Rossbach (*ros'bak*), Saxony, November 5, 1757	**Prussians** vs. French and Austrians	Makes Frederick the Great a national hero of Germany.
Rouen (*rōō-ān'*), **Siege of,** France, June, 1418 to Jan, 1419	**English** vs. French	Because of its desperate resistance, Henry V. granted the city honorable capitulation.
Sacriportis (*sak-ri-pōr'tus*), Italy, B. C. 82	**Optimates** vs. Democrates	Followed by Sulla's reign of terror.
Saguntum (*sa-gun'tum*), **Siege of,** Spain, B. C. 219	**Carthaginians** vs. Inhabitants.	Capture of this city by Hannibal the chief cause of the second Punic war.
St. Albans (*sānt ôl'banz*), England, May 22, 1455	**Yorkists** vs. Lancastrians	The first battle of the wars of the Roses; Yorkists defeated here in a second battle (1460).
Salamanca (*sal-ȧ-mang'kȧ*), Spain, July 22, 1812	**British** vs. French	This rout of the French lost them all southern Spain.
†**Salamis** (*sal'ā-mis*), Greece, September 20, B. C. 480	**Greeks** vs. Persians	Themistocles' great victory followed by Xerxes' withdrawal to Asia.
San Jacinto (*san jȧ-sin'tō*), Texas, U. S. A., April 2, 1836	**Texan Rebels** vs. Mexicans	Santa Anna captured by General Houston.
†**Santiago** (*sān-tē-ȧ'gō*), Cuba, July 3, 1898	**Americans** vs. Spaniards	Fleet of Admiral Cervera totally destroyed.
Saragossa (*sā-rā-gos'ȧ*), **Siege of,** Spain, Dec., 1808 to Feb. 21, 1809.	**British** vs. French	An important success which broke the spell of French invincibility.
Saratoga (*sar-a-tō'gȧ*), New York, U. S. A., October 7, 1777	**Americans** vs. British	Followed (October 17) by the surrender of Burgoyne, which was the turning point of the war.
†**Sea of Japan,** Sea of Japan, May 27-29, 1905	**Japanese** vs. Russians	Russia's naval power destroyed.
Sebastopol (*se-bȧs'tō-pōl*), **Siege of,** Crimea, September 26, 1854, to September 9, 1855	**French, British and Sardinians** vs. Russians	Brought to a close the active operations of Crimean war.
Sedan (*sē-dan'*), France, September 1, 1870	**Prussians** vs. French	Followed by the surrender of Napoleon III. with an army of 84,000 men.
Shipka (*ship'kȧ*) **Pass,** Bulgaria, August 20-23, 1877	**Russians** vs. Turks	Russians hold this strategic position against blindfold violence of the Turks.
Sempach (*zem'pȧK*), Switzerland July 9, 1386	**Swiss** vs. Austrians	Celebrated for the heroic devotion of Arnold von Winkelried.
Sentinum (*sen-ti'num*), Italy, B. C. 295	**Romans** vs. Samnites and Gauls.	Failure of the coalition to crush Rome from the north.
Seringapatam (*ser-ing'ga-pa-tam'*), **Siege of,** India, April 24, to May 4, 1799	**British** vs. Tippoo Sahib	With Bonaparte's failure in Egypt, this battle foils French designs on India.
Shiloh (*shi'lō*), Tennessee, U. S. A., April 6 and 7, 1862	**Federals** vs. Confederates	Defeated in the first day's fighting, Grant turned the tables the next day.
Shrewsbury (*shrōōz'ber-i*), England, July 21, 1403	**Henry IV.** vs. Percies	Hotspur defeated and slain.
Silistria (*si-lis'tri-ȧ*), **Siege of,** Bulgaria, March 28 to June 22, 1854	**Turks** vs. Russians	A brilliant defense conducted by the Turks under three English officers.
†**Sinope** (*si-nō'pē*), Black Sea, November 30, 1853	**Russians** vs. Turks	Turkish fleet destroyed and crews massacred.
Slivnitza (*slēv-nēt'sȧ*), Bulgaria, November 17, 18, 19, 1885	**Bulgarians** vs. Servians	The decisive action in the Servo-Bulgarian war.
†**Sluys** (*slois*), Flanders, June 22, 1340	**English** vs. French	Gave English control of the sea for thirty years, enabling them to land troops in France at will.
Smolensk (*smol-yensk'*), Russia, August 17-18, 1812	**French** vs. Russians	First stand of the retreating Russians before Napoleon's advance on Moscow.
Soissons (*swȧ-sôn'*), France, 486	**Franks** vs. Romans under Syagrius	The first military exploit of Clovis.
Solferino (*sōl-fā-rē'nō*), Italy, June 24, 1859	**French and Piedmontese** vs. Austrians	The horrors of this battle and Prussia's threatening attitude caused Napoleon III. to make peace.
Somme (*som*), a river in northern France, July 1 to Sept. 15, 1916	***Germans** vs. Allies	During this period the Germans were enduring terrific attacks from the Allies, but lost little ground.
†**Southwold** (*south'wōld*) **Bay,** North Sea, May 28, 1672	**English and French** vs. Dutch.	A victory gained by the duke of York over De Ruyter's superior numbers.
Sphacteria (*sfak-tē'ri-ȧ*), Greece, B. C. 425	**Athenians** vs. Spartans	To the amazement of the Greek world, 292 Spartan hoplites surrendered.
Spicheren (*spich'er-en*), Palatinate, August 6, 1870	**Prussians** vs. French	Reveals great superiority of Prussians from the outset of the war.
Stamford (*stam'ferd*) **Bridge,** England, September 25, 1066	**English** vs. Danes	This diversion of Harold to the North left William to land in England undisturbed.
Standard, Battle of the (or Northallerton), England, August 22, 1138	**English** vs. Scots	For 200 years saved Yorkshire from Scottish invasion.
Steenkerke (*stān'kerk'e*), Netherlands, July 24, 1692	**French** vs. English and Allies	Five English regiments utterly cut to pieces.
Sterling, Scotland, 1297	**Scots** vs. English	Before the end of the year all Scotland threw off the English yoke.
Stralsund (*shträl'zōōnt*), **Siege of,** Germany, March, August 3, 1628.	**Protestant Inhabitants** vs. Catholic Imperialists	Wallenstein fails to secure this important Baltic port.
Syracuse (*sir'a-kūs*), **Siege of,** Sicily, B. C. 415-413	**Syracusans and Spartans** vs. Athenians	The weakening of Athenian resources in this siege was the final cause of their failure in the Peloponnesian war.

GREAT AMERICAN AND FOREIGN BATTLES—Continued

Name of Battle, Approximate Location, Date	Contesting Nations or Parties	Results and Marked Features of the Contest
Syracuse, Siege of, Sicily, B. C. 387.	**Greeks** vs. Carthaginians	The Syracusan tyrant, Dionysius, connives at the escape of the Carthaginian Himilco.
Syracuse, Siege of, Sicily, B. C. 214-212	**Romans** vs. Carthaginians and Syracusans	Syracuse captured and plundered by the Romans.
Talavera (*tä-lä-vä'rä*), Spain, July 28, 1809	**British and Spaniards** vs. French	After this first great pitched battle in the Peninsular campaign Wellesley became commander-in-chief of all the English troops.
Tanagra (*tan'ä-grä*), Greece, B. C. 457	**Spartans and Bœotians** vs. Athenians	The Spartans failing to follow up their victory, Athens conquered Bœotia the following year.
Tarentum (*tä-ren'tum*), **Siege of,** Italy, B. C. 274-272	**Romans** vs. Tarentines and Epirots	Tarentum, deprived of her army, her ships and her walls, retained the right of local self-government.
Tauss (*tous*), Bohemia, August 14, 1431	**Bohemian Hussites** vs. Catholic Imperialists	At Procop's approach the Imperialists fled in confusion; this was the last effort to crush the Hussites by force of arms.
Telamon (*tel'ä-mon*), Italy, B.C. 225.	**Romans** vs. Gauls	The annihilation of the Gallic army was followed by the Roman invasion and conquest of Cisalpine Gaul.
Tel-el-Kebir (*tel'el-kä-bēr'*), Egypt, September 13, 1882	**British** vs. Egyptian Rebels	Arabi Pasha's army completely broken up; the British entered Cairo the next day.
Temesvar (*tem'esh-vär*), Hungary, August 9, 1849	**Austrians** vs. Hungarians	The last stand made by the Hungarians in the war; their army was totally routed and dispersed.
Testry (*tes-trē'*), France, 687	**Austrasians** vs. Neustrians	Pippin of Heristal, mayor of the palace, unites the Frankish territories under one rule.
Tewkesbury (*tūks'ber-i*), England, May 4, 1471	**Yorkists** vs. Lancastrians	Ends armed opposition to Edward IV.; Margaret of Anjou was captured and her son slain.
Texel (*tek'sel*), North Sea, June 2, 3, 1653	**British** vs. Dutch	The command of the sea fell into the hands of the English fleet.
Thapsus (*thap'sus*), North Africa, February 6, B. C. 46	**Cæsar** vs. Followers of Pompey.	The battle of Thapsus was the death-knell of the Pompeian cause.
Thermopylæ (*ther-mop'i-lē*), Greece, B. C. 480	**Persians** vs. Spartans and Thespians	Leonidas, with 300 Spartans and 700 Thespians, defended the pass to the last man against overwhelming forces.
Tiberias (*tī-bē'ri-äs*), Palestine, 1187.	**Saracens** vs. Crusaders	Followed by the conquest of Jerusalem by Saladin, which led to the third crusade.
Ticinus (*ti-sī'nus*), Italy, B. C. 218.	**Carthaginians** vs. Romans	Hannibal's success brought in numerous adhesions from Gallic tribes; followed by the battle on the Trebia.
Ticonderoga (*tī-kon-de-rō'gä*), New York, U. S. A., July 8, 1758	**French** vs. British and Americans	British and Americans displayed in vain prodigies of valor in the rush on Montcalm's almost impregnable position.
Tigranocerta (*tig-rä-no-cer'tä*), Armenia, October 6, B. C. 69	**Romans** vs. Armenians	Lucullus cut to pieces the huge army of Tigranes and secured immense booty.
Tinchebrai (*tansh-brä*), France, 1106.	**English** vs. Normans	Henry I. defeated and captured his brother Robert and annexed Normandy to the crown of England.
Tolbiac (*tol-bī'ak*), Germany, 496	**Franks** vs. Alemanni	Clovis wins lands of the Alemanni; he and his followers become Roman Christians in fulfillment of a vow taken on the battlefield.
Torgau (*tôr'gou*), Saxony, November 3, 1760	**Prussians** vs. Austrians	The last pitched battle of the Seven Years' war, in which the Austrians are said to have lost 20,000 men.
Torres Vedras (*tor'resh vä'drāsh*), **Lines of,** Portugal, October 12, 1810 to March 5, 1811	**British and Portuguese** vs. French	Wellington's defense permanently arrested Napoleon's march of conquest and was thus the turning point of the Peninsular campaign.
Toulon (*tōō-lôn'*), **Siege of,** France, Sept. 18 to Dec. 17, 1793	**French** vs. Garrison of British, Spaniards, Italians and French Royalists	This siege is memorable as the first important appearance of Napoleon, who commanded the artillery.
Tours (*tōr*), France, 732	**Franks** vs. Saracens	Here Charles Martel saved western Christendom from the Moslem invader.
Towton (*tou'ton*), England, March 28 and 29, 1461	**Yorkists** vs. Lancastrians	This battle, the most obstinate and bloody of the war, secured Edward IV. in his possession of the crown.
†Trafalgar (*traf-al-gär*), Spain, October 21, 1805	**British** vs. French	Nelson's last and greatest victory destroyed all possibility of Napoleon's invading England.
Trebia (*trē'bi-ä*), Italy, December, B. C. 218	**Carthaginians** vs. Romans	By this splendid victory Hannibal justified his march into Italy; the way into Etruria was now open to him.
Tunis (*tū'nis*), **Siege of,** North Africa, 1270	**Moslems** vs. French Crusaders.	This crusade, in which Louis IX. lost his life, was the last.
Turin (*tū'rin*), Italy, September 7, 1706	**Prince Eugene** vs. French	The French were permanently excluded from Italy.
Tyre (*tīr*), **Siege of,** Phenicia, January to August, B. C. 332	**Macedonians** vs. Tyrians	The greatest of Alexander's triumphs; Alexandria in Egypt takes the place of Tyre as a commercial metropolis.
†Ushant (*ush'ant*), North Atlantic, June 1. 1794	**British** vs. French	A brilliant victory won by Lord Howe.

GREAT AMERICAN AND FOREIGN BATTLES—Concluded

Name of Battle, Approximate Location, Date	Contesting Nations or Parties	Results and Marked Features of the Contest
Valmy (*văl-mē'*), France, September 2, 1792	**French** vs. Prussians	Goethe said that from Valmy dates a new era. It showed that revolutionary France would and could resist Europe.
Varna (*văr'nă*), Bulgaria, November 10, 1444	**Turks** vs. Hungarians	King Ladilas lost his life and his army was scattered to the winds.
Vercellae (*ver-sel'ē*), Italy, July 30, B. C. 101	**Romans** vs. Cimbri	Marius and Catulus utterly destroyed the vast barbarian horde which had been threatening Italy with invasion.
Verdun (*ver-dun'*), **Siege of,** France, from February, 1916, on	***Germans** vs. French	The powerful attacks of the Germans for almost a year against the fortress of Verdun were without success.
Vicksburg, Siege of, Mississippi, U. S. A., May 19 to July 4, 1863	**Federals** vs. Confederates	Grant's success at Vicksburg, together with the battle of Gettysburg, were the turning points of the war.
Vienna (*vē-en'ä*), **Siege of,** Austria, July 14 to September 12, 1683	**Austrians** vs. Turks	The besieged were reduced to the last extremity when Sobieski intervened and put the invading Turks to flight.
†Vigo (*vē'gō*) **Bay,** Spain, October 12, 1702	**English and Dutch** vs. French and Spaniards	The destruction of the Spanish galleons and the protecting **French** fleet gave a blow to the finances and prestige of the two crowns.
Vimiero (*vē-mä'rō*), Spain, August 21, 1813	**British** vs. French	Wellesley inflicted a signal defeat on the French, but his senior officer made no use of the victory.
Vittoria (*vē-tō'rē-ä*), Spain, June 21, 1813	**British** vs. French	This, the crowning victory of Wellington's peninsular campaign, won Spain from Napoleon.
Wagram (*vä'gräm*), Austria, July 6, 1809	**French** vs. Austrians	One of the most terrible and least decisive battles of all time.
Wakefield, England, December 30, 1460	**Lancastrians** vs. Yorkists	Queen Margaret's army completely defeated that of the duke of York, who was slain on the battlefield.
Wandewash (*wän-de-wäsh'*), India, January 22, 1760	**British** vs. French	Coote's victory was the death-blow to French power in India.
Warsaw (*wôr'sô*), **Siege of,** Poland, August 19 to September 7, 1831	**Russians** vs. Poles	The fall of Warsaw ends the Polish insurrection and Poland becomes a province of the Russian empire.
Waterloo (*wô-ter-lōō'*), Belgium, June 18, 1815	**British and Prussians** vs. French	The final overthrow of Napoleon by Wellington and Blücher. Napoleon was transported to St. Helena, where he died in 1821.
Wavre (*vä'vr*), Belgium, June 18, 1815	**French** vs. Prussians	Grouchy's victory was useless, while he might have saved the day for Napoleon had he arrived at Waterloo when expected.
Wei-hai-wei (*wā'hī'wā'*). China, January 30 to February 12, 1894.	**Japanese** vs. Chinese	The Chinese admiral gave up the remnant of his fleet and killed himself; followed by negotiations for peace.
Worcester (*wŏŏs'ter*), England, September 3, 1651	**Cromwellians** vs. Scottish Royalists	Followed by the submission of Scotland and Charles II.'s adventurous escape to France.
Wörth (*virt*), Bavaria, August 6,1870.	**Prussians** vs. French	A bloody contest and a decisive victory, followed by the retreat of the French.
Xeres (*hä-räs'*), Spain, July 19, 711.	**Moors** vs. Visigoths	Without having to fight any second battle, the Moors under Tarik mastered Spain.
Yalu (*yä'lōō*) **River,** Manchuria, September 17, 1894	**Japanese** vs. Chinese	This action conferred upon the Japanese the full command of the sea and greatly aided the land power.
Yorktown, Siege of, Virginia, U. S. A., Sept. 30 to Oct. 19, 1781.	**Americans** vs. British	The surrender of Cornwallis at Yorktown practically brought to an end the war of the American Revolution.
Ypres (*ē'pr*), Belgium, October 21-31, 1914 and November 10-12,1914.	**Allies** vs. Germans	A series of the most desperate struggles of the war. The German attempt to break through to Calais, France, failed.
Zama (*zā'mä*), North Africa, B. C. 202	**Romans** vs. Carthaginians	Scipio defeated Hannibal and annihilated his army, thus ending the second Punic war.
Zorndorf (*tsôrn'dorf*), Prussia, Aug 25, 1758	**Prussians** vs. Russians	A desperate and bloody struggle, after which the Russians retired into Poland
Zurawno (*tsu-raw'no*), **Siege of,** Austria, 1676	**Poles** vs. Turks	John Sobieski made an heroic defense against numbers and won an honorable peace.

BOOK OF LANGUAGE AND LITERATURE

HOW TO SPEAK CORRECT ENGLISH
HOW TO WRITE CORRECT ENGLISH
ABBREVIATIONS, CONTRACTIONS AND DEGREES
FORMS OF WRITTEN ENGLISH
LETTER WRITING AND CORRESPONDENCE
DICTIONARY OF CLASSIC WORDS AND PHRASES
WORDS AND PHRASES FROM MODERN LANGUAGES
DICTIONARY OF SYNONYMS AND ANTONYMS
ENGLISH AND AMERICAN LITERATURE
CHARTS OF ENGLISH AND AMERICAN AUTHORS
DICTIONARY OF LITERARY ALLUSIONS
PRONOUNCING DICTIONARY OF MYTHOLOGY
CHART OF GREEK AND ROMAN MYTHS

BOOK OF LANGUAGE AND LITERATURE

HOW TO SPEAK CORRECT ENGLISH — Fundamental Rules — The Organ of Speech — Vowels — Consonants — Table of Consonants — Rules of Pronunciation — Common Errors in Pronunciation — Expression — Inflection of the Voice — WRITTEN ENGLISH — Rules Relating to Style — Grammatical Construction — Right and Wrong Use of Words in Speaking and Writing — Use of Capital Letters — Abbreviations, Contractions and Degrees — Punctuation — Rhetorical Figures of Speech — FORMS OF WRITTEN ENGLISH — Letter Writing or Correspondence — Official and Titled Salutations — Narration — (Biography — Fiction and Drama—News) — Exposition — (Essay — Editorials) — Description — Argument — Poetry and Poetics — PRONOUNCING DICTIONARY OF CLASSIC WORDS AND PHRASES — PRONOUNCING DICTIONARY OF WORDS AND PHRASES FROM THE MODERN LANGUAGES — ENGLISH AND AMERICAN LITERATURE — OUTLINE CHARTS OF ENGLISH AND AMERICAN AUTHORS — DICTIONARY OF LITERARY ALLUSIONS: Famous Books, Poems, Dramas, Literary Characters, Plots, Pen Names, Literary Shrines and Geography, and other Miscellany — PRONOUNCING DICTIONARY OF MYTHOLOGY: Gods, Heroes, and Mythical Wonder Tales — CHART OF GREEK AND ROMAN MYTHS, their Origin, Relationship and Descent.

HOW TO SPEAK CORRECT ENGLISH

Correctly spoken English is quite as important as correctly written English. Errors in pronunciation, modulation and general expression are of frequent occurrence, and it sometimes seems that the erroneous utterance of whole classes of words league the tongue and ear against their right use. An improved standard of pronunciation, therefore, is the safest bulwark against a permanent deterioration of our language, as well as a positive influence in advancing individual culture of speech.

Five Fundamental Rules.—The essential steps toward securing the unconscious ability to speak correctly may be set down as follows:

1. Early instruction in the elementary sounds, and their mode of representation.
2. To observe the current usage of the best speakers with regard to such words as are most liable to be mispronounced.
3. To note the standard of pronunciation and expression of the best dramatic theaters.
4. By forming the habit of frequent reference to the dictionary and learning to interpret at sight the authorized pronunciation.
5. Ample practice in the reading and application of the leading principles of pronunciation that give words their true spoken values.

The Organ of Speech.—The mouth is the organ of speech; and the manner of production of the various sounds is of the first importance in the cultivation of correct pronunciation.

The sound uttered depends upon the form of the mouth. Change the form and you change the sound. Each particular sound is produced from a particular position.

Not more than one sound can be produced from one position of the mouth.

To produce a different sound you must change the position.

Each sound should be clear and precise. There should be no slurring.

The muscles must be under perfect control so that the mouth (lips and tongue included) may readily assume the position necessary for the emission of the required sound.

The proper use of the lips is the great factor in fluent speech.

It is from inability to use or negligence in using the muscles of the organ of speech that Americans are such indifferent linguists and frequently even incapable of distinct utterance of their own language.

The manner of production of the various sounds is of the first importance in the cultivation of correct pronunciation.

Vowels.—Pronounce the following words: moor; meer; merry; marry; mar; more. The whole compass of the mouth is brought into exercise by these words.

The first sound is produced from the lips. The second comes from a point just inside the mouth. The third sound point is farther back still. The last vowel is uttered from the throat.

If the sound *a* (long) as in bare, fair, is included, we have a scale of seven sounds produced by a gradual opening of the mouth, the sound point receding note by note from the front of the lips to the back of the throat, thus: moor, meer, merry, Mary, marry, mar, more.

In cultured English centers and in some parts of New England, the long sound of *ä*, No. 4, appears in such words as dance, France, glass, castle, cast, past, grasp, grant, etc.

In pronouncing the four words—meer merry, marry, mar—the mouth is gradually opened. The four separate "sound points" may be clearly recognized.

Repeat slowly:

1	2	3	4
meer	merry	marry	mar
mee	mé	mâ	mä
ee	é	â	ä

O is a single sound. In conversation, however, it usually becomes double, being combined with the sound—oo (as in too, tooth, woo)—thus:

so is pronounced so-oo
no is pronounced no-oo
go is pronounced go-oo

The short *o* sound is pronounced as in hot, pot, nod, God.

O followed by a double consonant is short:

off not awf
office not awfice
coffee not cawfee
cross, dross, loss, toss

The sound *oo* unites with the open sound *ä* to form the double sound in such words as—cow, how, now:

cä-oo	cow
nä-oo	now
dä-oo-n	down
ä-oo-t	out

The sound *u* is a peculiar combination of at least three sounds. It is really a continued flow from *ee* to *oo*.

The letter is pronounced exactly as the word *you*. Speak the vowel very slowly.

The intermediate sound of û may be represented thus:

u is ee-û-oo
duke is dee-û-oo-k
tube is tee-û-oo-b
mute is mee-û-oo-t

The same sounds occur in such words as few, new, mew.

The middle sound is the most important, and the first and last must be cut very short for a good style.

Ru and *lu*. When *u* is preceded by *r* or *l*, the first portion of the triple sound is omitted and a double vowel sound is heard—the last part also being cut very short.

Consonants.—Speak slowly and pronounce every letter.

Initial Consonants.—Of these only two require special attention:

th and *sh* followed by *r*.

Children frequently say:—one, two, *free;* and grown-up people will speak of—shrimps as *srimps*.

Examples: three, shrimp; thread, shrill; throat, shrink; thrush, shroud; through, shrew.

Final Consonants.—The slurring or omission of final consonants is a greater fault than the mispronunciation of vowels, for it points directly to carelessness and indolence on the part of the speaker.

R. It is sometimes stated that there is no *r* sound in English.

In singing the *r* is always made distinct.

It should also be apparent in conversation. Thus: *father* and *farther* are quite distinct. So, too, *ma* and *mar*.

The *t* belongs to the preceding syllable and the words should be pronounced thus: nat-ure, feat-ure, pict-ure, premat-ure, creat-ure, fut-ure, indent-ure, nurt-ure.

The consonant values of *w* and *y* are never terminal in a syllable, but are followed in the same syllable by a vowel. In attempting, for phonic practice, to sound either of these consonants apart from its vowel, make it continuous, not abrupt.

H cannot be separated from its accompanying vowel. Pronounce *ha, he, hi, ho, hu, hy*. Notice that the office of *h* is *to cover the following vowel with breath*. It will be seen, on careful examination, that any attempt to sound *h* alone will result in whispering a vowel with it.

Wh has for its initial sound simply unvocalized breath, poured through the lips placed in position for *w*. As a whole the digraph is sounded as it would naturally be if the order of the letters were reversed, thus, *hw;* as, *when, while, whip*, pronounced *hwen, hwile, hwip*.

Lisping children and Germans need to carefully observe the sounds of *s* and *th*.

The sound of *s* is formed by forcing unvocal breath between the tip of the tongue and the upper gum.

Th is produced by placing the tip of the tongue between the teeth or against the upper front teeth, and forcing vocal or unvocal breath between the tongue and the teeth. If vocal breath is used, sonant *th* is heard, as in *this;* if unvocal breath, then non-sonant *th* is produced, as in *thin*—this last is the sound made for *s* by those who lisp (lithp).

TABLE OF CONSONANTS

Name according to exit of sound	Checks		Spirants, Breathings*		Liquids Trills	Nasals
Name according to quality of sound	Tenues Sharp Hard	Mediæ Flat Soft	Sharp Hard	Flat Soft		
Organic Names: Labials	p	b	.....	w	.....	m
Labiodentals	.....	.....	.....	v	.....	.....
Dentals	t	d	th in thunder	th in this	l	n
			s	z	.....	.....
Palatals	.....	.....	sh	j in (Fr.) jour	.....	.....
				s in pleasure	.....	.....
			ch in church	j in John	r	.....
			ch in (Germ.) ich	y in you	.....	.....
Gutturals	k, q, c	g in go	ch in Scotch (loch)	g in (Germ.) tage	.....	ng

*Some of the *Breathings* are often called *Aspirates*.

ACCENT OF WORDS

One syllable of every word with two or more syllables receives, in pronouncing, *more force* than another. This stronger force is called Accent, and the syllable which receives this force is said to be *accent'ed*.

Marks of Accent.—The primary accent is marked with a firm oblique stroke, thus: *ob'ject, object', discov'er*. The secondary accent is marked by a similar but lighter stroke, or sometimes by two light strokes, thus: *lem'on-ade'* (or *lem''on-ade'*).

Unaccented Vowels.—Every vowel, when under either the primary or the secondary accent, is distinct; that is, the exact sound of the vowel is evident, as short *a*, long *i*, broad *o*, etc. In an unaccented syllable, the vowel sound is sometimes doubtful; in most instances, however, it is not. For instance, a correct speaker says: ăttĕn'tĭve, ăn'ĕcdōte, cōmprĕhĕnd', ăllĕgā'tiŏn, chăp'ĕl, prĕs'ent, ĕm'ĭnĕnt, prāi'rĭe, au'dĭĕnce, căl'loŭs.

RULES OF PRONUNCIATION

Rule 1.—The letter *u* should not be sounded as *oo*, except when immediately preceded by the sound of *r*.

Exceptions: sure and its derivatives, also sumac, tulle, hurrah, pugh.

Pronounce rule, fruit, garrulous, ruin, sure, tūne, mūle, institūte, constitūtion, sūture, dūty, lūcid.

Rule II.—*A* constituting or ending an unaccented syllable is short Italian *a*.

Examples: cănine', lăpel', ăgain', ălas', fătal'ity, al'kăli, or'nament, pal'ătable.

When the *a* of terminal *ary* or *any* is immediately preceded by an accented syllable, it has the sound of short Italian *a;* thus, pri'mary, epiph'any.

Rule III.—*E* or *o* constituting or ending a syllable is long.

Examples: ēvent, mēmentō, lōcōmōtion, sōciety, nōtōriety, sōbriety, supērior, infērior, thēories, cōterie, lōcō-fōcō.

Rule IV.—*I* constituting or ending an unaccented syllable not initial, is always short, and is usually short even in initial syllables, if unaccented.

Examples: Dĭvide, dĭrect, fĭnance, phĭlosophy, imĭtate, pĭazza, tĭrade, intĭmate, indĭvisĭble, nobĭlity.

In the *initial* syllables *i, bi, chi, cli, cri, pri, tri,* however, *i* is generally *long.*

Examples: īdea, īdle, īsothermal, bīology, Chīnese chīrurgery, clīmatic, crīterion, prīmeval, trīangular, trīpod.

Rule V.—*E* before terminal *n* should always be silent in participles, and also in most other words.

Examples: given (giv n), taken (tak n), bitten (bit n), broken, spoken, riven, fallen.

But in the following words *e* must be sounded:

Aspĕn, chickĕn, glutĕn, kitchĕn, lichĕn, lindĕn, martĕn, mittĕn, suddĕn.

It must also be sounded in any word (not a participle) in which terminal *en* is immediately preceded by *l, m, n,* or *r*.

Examples: womĕn, linĕn, omĕn, barrĕn, Helĕn, Allĕn, Ellĕn, woolĕn, pollĕn.

Rule VI.—*E* before terminal *l* should usually be sounded.

Examples: levĕl, bevĕl, novĕl, nickĕl, cancĕl, vessĕl, chapĕl, gravĕl, hovĕl, camĕl, channĕl, kernĕl, Abĕl, Mabĕl, panĕl, modĕl, funnĕl, flannĕl.

But in the following words the *e* before terminal *l* must not be sounded:

Betel (bē'tl), chattel (chat'tl), drivel, easel, grovel, hazel, mantel, mussel, navel, ravel, shekel, shovel, shrivel, snivel, swivel, teasel, weasel, and their derivatives.

Rule VII.—In all but the following words, *i* before terminal *l* or *n* must be sounded: devil, evil, weevil, basin, cousin, raisin.

Pronounce Latĭn, satĭn, matĭn, spavĭn, anvĭl, civĭl, cavĭl, councĭl, perĭl, javelĭn, lentĭl, pistĭl, resĭn, fusĭl, coffĭn, codicĭl, axĭl.

Rule VIII.—The eight words, bath, cloth, lath, moth, mouth, oath, path, wreath, and these only, require sonant *ths* in the plural.

Pronounce m*o*ths, p*a*ths, truths, o*a*ths, heaths, cl*o*ths, b*a*ths, l*a*ths, deaths, wr*ea*ths, m*ou*ths, Sabbaths, sheaths, piths, plinths, lengths, widths, depths, breadths, earths, myths, Goths, fourths, breaths.

Rule IX.—*O* in a final unaccented syllable ending in a consonant, frequently verges toward the sound of short *u;* as in custom, felon, bigot, bishop, method, carol, Briton. But it has its regular short sound in pentagon, hexagon, octagon, etc.

When, however, the termination *on* is immediately preceded by *c, ck, s* or *t*, the *o* is commonly suppressed.

Examples: bacon, beacon, beckon, benison, button, cotton, crimson, damson, deacon, garrison, glutton, lesson, mason, mutton, parson, person, poison, prison, reason, reckon, season.

Rule X.—*I* accented in most words from the French has the sound of long *e*.

Examples: pĭque, caprĭce, guillotĭne, quarantĭne, routĭne, suĭte, fatĭgue, valĭse, antĭque, Bastĭle, critĭque, palanquĭn, tambourĭne, regĭme (rā-zheem'), cuĭsĭne (kwe-zeen'), unĭque, intrĭgue, magazĭne.

Rule XI.—*Ou* in most words from the French has the value of *oo*, but in Anglo-Saxon words it has the sound of *ow*, as in *cow*.

Examples: bouquet, contour, croup; out, bound, sound.

Note.—*Ou* has also other values, as in soul, rough, adjourn, could, ought, hough (hŏk), trough.

Rule XII.—*X* followed by an accented vowel, or by an accented syllable beginning with a silent *h*, has the sound of *gz*.

Examples: luxu'rious, exam'ple, exhaust', exhale', exhib'it, exam'ine, exalt', exec'utive.

Rule XIII.—The termination *tion* is always *shun*, except when it follows the letter *s* or *x*, as in question (kwestyun), bastion, combustion.

Examples: notation, completion, equation, relation, suggestion, transition (tranzish'un).

Rule XIV.—The termination *sion* immediately preceded by an accented vowel is *zhun;* when not so preceded it is *shun*.

Examples: expulsion, immersion, mansion, excursion, diversion, explosion, adhesion, delusion.

Rule XV.—*C* is soft (*s*) before *e, i* and *y*, and hard (*k*) in other positions.

Examples: *ca, ce, ci, co, cu, cy.*

Exceptions: *c* is hard (*k*) in sceptic and scirrhus; and in the following words it has the sound of *z:* sacrifice (fĭz), sice, suffice, discern, and their derivatives. It is silent in czar, victuals, indict, and their derivatives, and also in the termination *scle*, as in *muscle, corpuscle.*

Rule XVI.—*G* is generally soft (*j*) before *e, i* and *y*, and always hard (*g*) before other vowels.

Examples: *ga, ge, gi, go, gu, gy.*

Note.—The exceptions to the rule that *g* is usually soft before *e, i* and *y* are many; but they are nearly all common Anglo-Saxon words, such as get, give, gild, girl, girdle, giddy, foggy, gimlet, geese, gig, giggle, gift, gills, begin, gimp, beget, gird, gear, gizzard.

RULE XVII.—In an accented syllable of any primitive word, a vowel before *r* followed by a syllable beginning with a vowel or another *r* has its short sound.

Examples: Ărab, ărabesque, ărid, Ăristotle, Săracen, bĕryl, pĕril, delĭrious, ĭrritate, mĭracle, delĭrium, abhŏrrence, flŏrid, cŏroner, fŏreign, tŭrret, bŭrrow, cŭrry, coŭrage, fŭrrow, py̆rrhic, empy̆real.

RULE XVIII.—*N* ending an accented syllable has the sound of *ng*, if immediately followed by hard *g* or *k*, or any equivalent of *k* (*c*, *q*, or *x*).

Examples: con'gress, gan'grene, con'cord, tran'quil, un'cle, an'ger, hun'ger, mon'key, san'guine, sin'gle, clan'gor, extin'guish, blan'ket, twin'kle, con'course, Lin'coln.

Exceptions: concrete, penguin, mangrove, Mongol, pancreas, and some others.

RULE XIX.—*C*, *s*, or *t*, when immediately preceded by an accented syllable and followed by *e*, *i* or *u*, has usually the force of *sh*, and is said to be "aspirated," as in ocean, nauseate, Asiatic, negotiation.

RULE XX.—In pronouncing the terminal syllables, *ble*, *cle*, *dle*, *fle*, *gle*, *kle*, *ple*, *stle*, *tle*, and *zle*, no vowel sound is heard. Terminal *cre*, however, is pronounced *kĕr*. The combination of any of these terminations with *ing* forms but one syllable.

Examples: quibbling, doubling, circling, meddling, huddling, ruffling, shuffling, giggling, struggling, pickling, trickling, coupling, rippling, battling, whittling, whistling, jostling, puzzling, muzzling, massacring.

COMMON ERRORS IN PRONUNCIATION

1. Do not pronounce *ing* like *in;* as *eve'nin* for *eve'ning*, *writ'in* for *writ'ing*.

Pronounce the following: Speak'ing, read'ing, talk'ing, walk'ing, stop'ping, smok'ing, suppos'ing, expect'ing, cel'ebrating.

2. Do not pronounce *ow* like *ur* or *uh;* as *hol'lur* or *hol'luh* for *hol'low*, *shad'ur* or *shad'uh* for *shad'ow*.

Pronounce the following: Bor'row, to-mor'row, nar'row, yel'low, fel'low, wid'ow, pil'low, mel'lowing, swal'lowing.

3. Do not pronounce *ed* like *id* or *ud;* as *unit'id* or *unit'ud* for *unit'ed*, *provid'id* or *provid'ud* for *provid'ed*.

Pronounce the following: Rest'ed, resid'ed, decid'ed, regard'ed, exhib'ited, cel'ebrated, excit'ed, delight'ed, support'ed.

4. Do not pronounce *ess* like *iss;* as *good'niss* for *good'ness*, *bold'niss* for *bold'ness*.

Pronounce the following: Hard'ness, bad'ness, harm'less, care'less, clear'ness, ful'ness, seam'stress, host'ess, em'press.

5. Do not pronounce *el* like *il*, nor *et* like *it*, nor *est* like *ist;* as *cru'il* for *cru'el*, *bask'it* for *bask'et*, *for'ist* for *for'est*.

Pronounce the following: Fu'el, du'el, bush'el, yet, get, mark'et, hatch'et, rock'et, rack'et, riv'ulet, hon'est, bold'est, larg'est, small'est, young'est, strong'est.

6. Do not pronounce *ent* like *unt*, nor *ence* like *unce;* as *si'lunt* for *si'lent*, *sen'tunce* for *sen'tence*.

Pronounce the following: Pru'dent, de'cent, mo'ment, gar'ment, mon'ument, gov'ernment, superintend'ent, par'liament (par'lĭ-ment), pa'tience, expe'rience, superintend'ence.

7. Do not insert the sound of short *u* before a final *m;* as *hel'um* for *helm*, *chas'um* for *chasm*.

Pronounce the following: Spasm, rhythm, phan'tasm, bap'tism, pa'triotism, elm, film, overwhelm', worm.

8. Do not give the drawling sound *ăōō* for *ou* (i. e. *ăōō*); as *căōō* for *cow*, *hăōōs* for *house*.

Pronounce the following: How, now, ground, sound, bound, found, town, gown, pound, confound', around', astound'.

9. Do not sound *sh* before *r* like *s;* as *srub* for *shrub*, *srink* for *shrink*.

Pronounce the following: Shred, shrine, shriek, shroud, shriv'el, shrunk'en.

10. Do not sound *wh* like *w;* as *wen* for *when*, *wat* for *what*.

Pronounce the following: Where, wheat, wharf, whale, whine, white, whim'per, whis'per, whip'ping, whit'tle.

11. Do not omit to give the sound of *r* after a vowel in the same syllable, as in *arm*, *form*, etc., not *ahm*, *fawum*, etc.

Pronounce the following: Dark, hark, start, chart, are, tar, remark', course, for, nor, door, floor, lord, hon'or, do'nor, short, support', report', pa'per, or'der, horse, purse, warm, alarm'ing, return'ing, reform'ing.

12. Do not add the sound of *r* to a final vowel or dipthong; as *lawr* for *law*, *ide'ar* for *ide'a*.

Pronounce the following: saw, draw, paw, claw, pota'to, toma'to, com'ma, Em'ma.

13. Do not shorten the sound of long *o* in certain words by leaving off its vanishing element *ōō*.

Pronounce the following: Boat, bone, broke, choke, cloak, colt, comb, dolt, hole, home, home'ly, hope, jolt, load, on'ly, road, rogue, smoke, spoke, spok'en, stone, throat, toad, whole, wrote, yoke, bolster.

14. Do not omit the sound of *d* when preceded by *n;* as *stan* for *stand*, *frenz* for *friends*.

Pronounce the following: Stands, bands, wĭnds, wīnds, depends', defends', demands', blind'ness, grand'mother, grand'father, hand'ful.

15. Do not omit the sound of *d* in the terminal letters *lds;* as *wīlz* for *wilds*, *fēlz* for *fields*.

Pronounce the following: Folds, holds, scolds, builds, scalds, unfolds', child's.

16. Do not omit the sound of *t* when preceded by *c hard* in the same syllable; as *aks* for *acts*, *exak'ly* for *exact'ly*.

Pronounce the following: Facts, tracts, com'pacts, inspects', respects', inducts', instructs', correct'ly, direct'ly, ab'stractly, per'fectly.

17. Do not omit the sound of *t* in the terminal letters *sts;* as *fis's* for *fists*, *pes's* for *pests*.

Pronounce the following: Posts, boasts, coasts, hosts, ghosts, accosts'.

18. Do not improperly suppress the vowel sounds in unaccented syllables; as *ev'ry* for *ev'er-y*, *his'try* for *his'to-ry*.

Pronounce the following: Belief', crock'ery, fam'ily, fa'vorite, des'perate, des'olate, nom'inative, mis'ery, li'brary, sal'ary, com'pany, com'fortable, perfum'ery, mem'ory, vic'tory, slip'pery, part'icip'le, sev'eral, bois'terous.

19. Do not suppress the sound of *e* or of *i* before *l* or *n* in those words in which it should be articulated; as *lev'l* for *lev'el*, *civ'l* for *civ'il*, *kitch'n* for *kitch'en*, *Lat'n* for *Lat'in*.

Pronounce the following: Trav'el, nov'el, bar'rel, par'cel, hov'el, chap'el, quar'rel, sor'rel, pen'cil, chick'en, lin'en, sud'den, mit'ten, sat'in.

20. Do not sound *e* or *i* before *n* or *l* in those words in which it is properly silent; *e'ven* for *e'vn*, *heav'en* for *heav'n*, *ba'sin* for *ba'sn*, *haz'el* for *ha'zl*, *e'vil* for *e'vl*.

Pronounce the following: Ha'ven, sev'en, gold'en, o'pen, short'en, wood'en, wak'en, wid'en, fro'zen.

21. After *r*, *ch*, or *sh* do not give the sound of long *u* when the simple sound of *oo* (long or short) should be heard; as *rule* for *rool*, *fruit*, for *froot*.

Pronounce the following: True, truth, grew, chew, sure, sug'ar, tru'ly, crew, brute, bru'tal, rude, through, cru'el, ru'by, ru'bicund.

22. Do not substitute the sound *oo* for that of long *u;* as *toon* for *tune*, *doo'ty* for *du'ty*.

Pronounce the following: Tube, duke, mute, nude, mu'sic, Tues'day, du'bious, lute, blue, ĭllume', illude', in'stitute.

23. The vowel *a*, when unaccented, at the end of a word has the sound of *ä* (as in *far*) somewhat shortened; as *com'ma* not *com'mĭ* nor *commä*.

Pronounce the following: Dra'ma, da'ta, pi'ca, so'fa, al'gebra, Chi'na, Amer'ica, dilem'ma, mi'ca, alpac'a, a'rea, neb'ula.

24. Give to the vowel *a* in the unaccented terminal syllables *al, ant, ance*, its short sound, but do not make it prominent.

Pronounce the following: Na'tional, par'tial, fi'nal, eter'nal, ig'norant, ty'rant, in'stant, fla'grant, vig'ilance, ig'norance, in'stance, fra'grance.

25. Do not give to the vowel *a* (as in *far*), when unaccented and made brief, the sound of short *u;* as *ŭbase'* for *abase'*, *ŭrouse* for *arouse'*.

Pronounce the following: Abound', abate', above', about', abridge', amuse', fanat'ic, ag'gravate, traduce'.

26. Do not give to long *e*, when unaccented and slightly abridged, the sound of short *u;* as *ŭvent'* for *event'*, *soci'ŭty* for *soci'ety*.

Pronounce the following: Emo'tion, vari'ety, sobri'ety, sati'ety, anxi'ety, impi'ety.

27. Do not give to long *o*, when unaccented and slightly abridged, the sound of short *u;* as *ŭbey'* for *obey'*, *prŭpose'* for *propose'*.

Pronounce the following: Opin'ion, obe'dience, provide', promote', provoke', pota'to, tobac'co, posi'tion, soci'ety, el'oquence, disposi'tion, mel'ody, composi'tion.

28. Do not sound short *o*, when unaccented, as short *u;* as *ŭbscure'* for *obscure'*, *cŭmmit'tee* for *commit'tee*.

Pronounce the following: Observe', oppose', command', conceal', condi'tion, contain', content', possess'.

29. Do not lay too much stress on an unaccented syllable or a syllable having a secondary accent; as *pri'ma'ry* for *pri'mary*, *ex'act'ly* for *exact'ly*.

Pronounce the following: Gigan'tic, precise'ly, salva'tion, loca'tion, vaca'tion, ter'ritory, sec'ondary, mat'rimony, prom'issory, vac'cinated.

30. In unaccented syllables do not bring out the quality of the vowel too distinctly.

In many words, "there would be pedantry in scrupulously avoiding the short and easier sounds which the organs are inclined to adopt." For instance, *cab'bage* in common conversation might be *cab'bij*, *pal'ace*, *pal'ăs*, etc.

a. When *a* at the end of an unaccented syllable is followed in the next syllable by *n* or *r*, it has nearly the sound of short *e*, as in *mis'cel-la-ny*, *cus'tom-a-ry*.

b. In the unaccented final syllable *ate*, of adjectives and nouns, the vowel *a* generally has a sound verging toward short *e*, as in *del'i-cate*, *con-sum'-mate* (*adj.*).

EXPRESSION

Speak firmly; take time. Articulate clearly; do not slur.

Correct pronunciation: requires—1. Exact vowel sounds. 2. Distinct terminal consonants.

Read just as you would speak under the same circumstances, so that if you could be heard without being seen, it would be impossible to tell whether you were reading or talking.

Avoid a monotone. Dull repetition of words in the same pitch is disagreeable. Enter into the spirit of what you read, and give expression to your natural feeling.

The simplest way to emphasize a word is to pause after it. The word may be spoken a little louder or may be pronounced more slowly than the other words in the sentence.

When speaking in public, address the person standing just behind the back row.

INFLECTION OF THE VOICE

Rising inflection is used in incomplete thought, or thought carried through consecutive phrases. It is used to express emotion, surprise, prayer.

Falling inflection denotes complete thought. It expresses command, authority.

The voice has three pitches:—upper, middle, lower.

The upper register is the medium for the expression of excitement and earnestness. It must be used with care and artistic moderation, otherwise it is unpleasant.

Use it rarely. Be careful of straining the voice.

The middle register is used in familiar speaking, and general conversation. It is the most durable, and is the vehicle for everyday use.

The lower register is suited to grave, solemn, impassioned utterances. It should be used cautiously. Practice will mellow the voice.

WRITTEN ENGLISH.

Written English is the art of putting words together in order to convey our thoughts to others. Good composition conveys our thoughts correctly, clearly, and pleasantly, so as to make them readily understood and easily remembered.

To express ourselves well we must first have something to say. If we have not been able to come to any definite conclusion about a subject, we should be silent.

We must next choose the right names for the things or actions of which we are going to speak. This is not always easy, for we are apt to talk loosely of quantities and qualities; to say there are "thousands" when there are only hundreds, to call an event "marvelous" when it is only unusual, or to refer to "ages" when there are only years.

Again, we must arrange our words in the right way, so that they shall fit one another and combine to make good sense, just as we must put bricks or stones together properly to make a building stand. All language is a construction; it is the building or binding of words.

There are many forms of written English, or composition—from a simple letter to the most elaborate treatise—but all are made up of the same elements, namely: words, sentences and paragraphs. It is essential, therefore, that these elements be thoroughly mastered at the outset. Beyond this comes the matter of style, the essentials of which may be summed up in four words: *Accuracy*, *Clearness*, *Strength* and *Grace*.

Accuracy and *Clearness* are requisite in all kinds of writing to insure the faithful presentation of thought.

Strength and *Grace* are more especially applicable to the higher branches of prose composition and to poetry.

Grammatical Connections.—No expression can form part of a good composition unless it be constructed in accordance with correct grammar. Every sentence is inaccurate which gives wrong forms of the parts of speech, or violates the rules of syntax. The most common errors are of two kinds:

(1) Errors in the use of single words or forms.

(2) False concords, that is, wrong genders, numbers, cases and tenses. (See Right and Wrong Use of Words.)

RULES RELATING TO STYLE

	GOOD STYLE	POOR STYLE
PURITY prescribes the use of	Correct forms and concords.	Wrong forms. Solecisms.
	Classic or good English words.	Barbarisms.
	Proper words, *i.e.*, words fit for the occasion.	Improprieties.
PERSPICUITY prescribes	Simplicity.	Roundabout, inflated or pedantic words or phrases.
	Brevity.	Tautology. Pleonasm. Verbosity.
	Precision.	Ambiguity or Obscurity. *a.* In words. *b.* In sentences from bad arrangement.

CHOICE AND USE OF WORDS.—Good usage—the usage of the best writers and speakers—sanctions only words that are in reputable, national, and present usage.

The term *Barbarism* is applied to unauthorized language. Some offenses against good usage are the following:

1. *Obsolete* words, words gone out of use.
2. *Provincialisms*, words peculiar to some locality.
3. *Colloquialisms*, words peculiar to familiar conversation.
4. *Solecisms*, ungrammatical expressions.
5. *Archaisms*, expressions which would be obsolete except for their occasional use in poetry.

The term *Impropriety* is used to designate reputable words misapplied.

Slang is a general name for current, vulgar, unauthorized language. It may take the form of barbarism or impropriety.

Use the fewest and simplest words that the subject will bear.

Specific words are usually more forcible than general terms.

Foreign and technical terms should be used with care.

Use idioms wherever it is possible.

Coherence demands that the parts shall be so connected that the thought will be clear and compact.

The length of sentences is governed by the effect to be produced. Short sentences give vigor, emphasis, and rapidity. Long sentences give weight and rhythm.

A well-constructed sentence keeps the same subject as long as possible.

All modifying elements should be placed as near as possible to the words they modify.

A *Dangling Element*—one that modifies nothing—must be avoided. Example: *Looking into the water*, a fish was seen.

A "*Squinting Construction*" is one that is so poorly placed in the sentence as to modify equally well the part preceding and the part following. Example: Will you say to Mr. Brown, *when he comes*, I will be ready.

Redundancy—A weak repetition of an idea—must be avoided.

Pleonasm consists in the addition of words which can be omitted without affecting the construction or the meaning of the sentence.

Tautology, or repeating a thought that has just been stated.

Verbosity or *Prolixity* is the fault in sentence-making caused by using needless words.

Don't begin a sentence with—and, but, also, so, then, next, however, after this, of course, in consequence, as a matter of fact.

THE PARAGRAPH.—A *Paragraph* is a division in composition treating only one part of the subject. A paragraph must conform to the same rules that should govern the whole composition; that is, it must show unity, massing, and coherence.

Unity demands that all the thoughts in a sentence, in a paragraph, or in the whole theme shall cluster about one main idea.

Massing demands that the important thoughts shall be placed in prominent places.

Coherence demands that thoughts shall be closely connected.

The length of paragraphs is not to be regulated absolutely: the subject-matter to be treated, the appearance of the page, and the comfort of the reader must all be considered. In a dialogue a new paragraph is begun with each change of speaker.

THE SENTENCE.—Rhetorically, sentences may be classified as periodic, loose, and balanced.

A *Periodic* sentence is one that holds the thought in suspense until the end. Example: In all his long life, from the time when, as a twelve-year-old boy, he was roaming in the fields and fishing the streams, to the days of his manhood, when he was upholding the honor of his state in the Senate, he showed the same simple, democratic nature.

A *Loose* sentence is one in which there is no attempt to show suspense; the different parts may come in where natural ease of expression suggests.

A *Balanced* sentence is one in which contrasting thoughts are stated in similar forms. Example: God made the country and man made the town.

The periodic and the balanced sentence are likely to result in artificiality of expression unless used with care. The loose sentence gives ease and naturalness, but these desirable qualities may easily change to slovenliness of expression in the hands of a careless writer.

Sentences, like paragraphs, should show unity, massing, and coherence.

Unity demands that the sentence shall have one main idea. The unity of a sentence is destroyed by putting together ideas that should be separated, by making the wrong idea subordinate, or by making ideas coördinate that are not of equal importance.

Examples of lack of unity:—

1. The words are very simple and I think it very strange that a tinker could write such a good book.
2. We went up the main road about half a mile, when we came to a pasture.

Massing in the sentence demands that the main thought shall be placed where it will "readily catch the eye."

RIGHT AND WRONG USE OF WORDS IN SPEAKING AND WRITING

A and An.—*a* is used before a consonant sound; *an*, before a vowel sound; as, "*a* boy;" "*an* eye;" when a vowel has a consonant sound, as in the word *eulogy*, *a*, and not *an*, is required. In the case of words beginning with *h*, *an* is always required when *h* is silent; as, "*an* heir;" when *h* is aspirated, *a* is required, unless the accent is on the second syllable, when *an* is used; as, "*a* history;" "*an* historian."

Abbreviations.—Such abbreviations or contractions as *e'er*, *ne'er*, *o'er*, *e'en*, *'tis*, *'mid*, and *'neath*, are legitimate in verse, but should not be used in prose.

Ability for capacity.—*Ability* is the power of doing; *capacity* the faculty of receiving. "The *ability* is in me to do him good." "Man's *capacities* have never been measured."

Abortive.—That is *abortive* which is premature, not brought to completion. A plan may be *abortive* but not an act. We may speak of an *abortive* effort.

About.—Not to be used as *almost*. "The day is *almost* gone," not "The day is *about* gone."

Above is an adverb, not an adjective. Say "The address given *above*," not "The *above* address;" the "foregoing section," not the "*above* section."

Accept of.—Never use the preposition after this verb. We *accept* invitations, presents, hospitality, and the like.

Accept and Except.—*Accept* means to take when offered; *except* means to leave out, to exclude. I *accepted* the gift. All *except* two will go.

Accord.—To *accord* means to render or bestow upon another, as honor: therefore one should never say, "The information he desired was *accorded* him."

Administer.—The man died from blows *administered* by the policeman. Oaths, medicine, affairs of state are *administered*. Blows are *dealt*.

Affect, Effect.—To *affect* means to influence or to pretend. To *effect* means to bring about. "He *affected* intoxication." "He *affected* the audience strongly." "I shall *effect* a reform."

Afraid.—The adjective *afraid* should not be used for the verb *fear;* thus: we say, "I am *afraid* of fire," but "I *fear* I cannot go," not "I am *afraid* I cannot go."

Aggravate means to heighten, intensify, or make worse. Do not use it for *annoy* or *provoke*.

Ain't.—This is illiterately employed as a contraction for *are not*, *am not*, *is not*. Even as a contraction of *am not* it is censured by many critics, the form *I'm not* being universally preferred. "Am I not?" is required in interrogative sentences.

Allow.—This word is frequently misused for *think*, as "I *allow* that I shall go to town." Say, I *think* that," etc.

Allude means to refer to indirectly, and not the same as *mention*. "By *mentioning* his lifelong companion he *alluded* to his wife."

Almost.—Careless speakers sometimes err in saying *most* for *almost*, as, for example, "I have read *most* all the books in the library," for "*almost* all."

Among and Between.—*Among* is distributive, and may apply to any number more than two; *between* is used of only two persons or things; as, "They discussed this *among* themselves;" "This is *between* us two."

Among One Another.—"*Among one another*" is censured by critics, "*with* one another," or "among themselves" being suggested as preferable.

And should not be used instead of *to* in such sentences as "I'm going to go and get it," for "I'm going to get it"; "Try and do it," for "Try to do it."

Angry At and Angry With.—"Angry *at*" is used when expressing anger for an animal or an inanimate object; "Angry *with*," for a human being; as, "He is *angry at* his dog;" "He is *angry with* his brother."

Anybody else's, Anybody's else.—The predominance of usage seems to be in favor of the first form, which is correct according to analogy of similar cases, which "throw" the apostrophe and s to the last word of the unified expression, generally nouns in apposition.

Any One, One, *anybody, each, any one, everybody, either, neither, one, some one, somebody,* should be followed by singular pronouns, or verbs.

Any one, anybody, each, every one, everybody, either, neither, nobody, some one, somebody, may be followed by *he* or *his*.

"*Any one* of these patterns *is* suitable." "*Every one* of the ladies *is* here." "*Each one* of the soldiers *has* a new uniform." *If any one wishes* to make a suggestion, I wish *he* (or she, or he or she) would make it." "*Anybody* in *his* senses would have done it."

One should be followed, by *one* or *one's*." "*One* dislikes to be told of *one's* errors."

Appreciate means to estimate justly. "I appreciate his ill-will." means "I am fully aware of the extent and intensity of his ill-will."

Apt, Likely, Liable.—*Apt* means *quick* or *skillful*. "He is apt to learn," means that he learns readily. "He is likely to learn," means that he will probably learn. "He is liable to learn," is incorrect. *Liable for* means responsible for; *liable to* means subject to. "He is liable for the entire sum, and liable to imprisonment if he does not pay."

Apprehend and Comprehend.—*Apprehend* means to *perceive;* as, "I *apprehend* danger." *Comprehend* means to *understand;* as, "I *comprehend* your meaning."

As should not be used for *that* in such constructions as, "I do not know *that* I do."

As—As, So—As.—Use the former in affirmative and the latter in negative propositions. "We are *as* wise *as* our teachers." "I am not *so* young *as* I used to be."

As If It Was.—*Were*, and not *was*, is required after *as if*, for the reason that the supposition is not known; thus: "It looks *as if it were* all right," not "it looks *as if it was* all right."

As though is often used for *as if*. In the sentence "He walked *as though* he were lame," if the ellipsis is supplied the error will be evident. "He walked *as* (he would walk) *though* he were lame." *As though* is seldom correct.

At, At and To, At All.—The presence of *at* improves such constructions as "He is *at* home," instead of "He is home" *At* and *to* are superfluous in such sentences as, "Where is he?" and "Where has he gone?" hence, their use should be avoided. *At all* is superfluous in such sentences as, "There is no use in your going;" "I do not know him."

Authoress, Actress.—The terms "author*ess*," "doctr*ess*," edit*ress*," poet*ess*," "lectur*ess*," are no longer used, *author*, *doctor*, etc., being correct for both sexes. Act*ress*, not *actor*, however, is the required form for the feminine gender.

Avocation, Vocation.—*Avocation* should not be used for *vocation*. *Vocation* is one's employment; *avocation*, one's diversion from that employment.

Awful, Awfully.—Do not use these words as intensives or for supposed force. *Awful* should mean that which inspires awe. "The *awful* mysteries of the world unseen."

Bad, Badly.—*Bad* is not to be used for severe, as "I have a *bad* headache." *Badly* is also inelegantly used for very much, as "I need money *badly*."

Character.—It is in general wrong to speak of a person as a *character*. *Character* is justly applied to the ideal personages delineated by novelists. Possessing no real personality, they are *characters* and nothing more.

Character, Reputation.—One's *character* is what one really is; one's *reputation* is what people think of one. We may have a good *character* and a poor *reputation*, and *vice versa*.

Choose, Chosen.—"She has chose the blue silk." Say "has chosen." But say, in the imperfect, "she chose him in preference to the others."

Combine together.—"He combined them together." Omit *together*.

Commence, Begin.—*Begin*, when followed by a verb, takes *to* and the infinitive after it. *Commence* should take the present participle. We "begin to do," we "commence working." *Begin* may take the participle, but *commence* should take the infinitive.

Consonant.—"It is *consonant to* our nature," is a more usual expression than "it is *consonant with*." But *consonant with* is not improper.

Contractions, while not permissible in dignified utterance or in formal writing, are in accordance with the conversational employment of the language. The following is the list:

I'm not, you're not, he's not, we're not, they're not are used in the declarative form, and *isn't he* (*she*, or *it*), *aren't you* (*we, they*) in the interrogative. In the declarative form, *You're not, he's not*, etc., are preferable to *you aren't, he isn't*, etc. *Am I not* is not contracted, *ain't* being regarded as objectionable for *am I not*, and as a vulgarism for *isn't*. [See *ain't*.]

"He (she or it) *don't*" for He (she or it) *doesn't* is always incorrect. *I don't, you don't, he doesn't, we don't, you don't, they don't*, are in accordance with the conversational employment of the language.

Mayn't I (or *may I not*) is correct in the interrogative form; *you can't* (or *you can not*) in the declarative form. In this connection note that *may* is used when asking and granting permission, and that *can*, which ordinarily expresses ability, is used in the declarative form when denying permission; thus: "*May* I go." "No, you *can not*."

The contractions *shan't* and *won't* are in accordance with conversational usage.

Conversant.—We are conversant *with* men and *in* things. *Conversant about things* is improper.

Converse together.—"They conversed together for more than an hour." Omit *together*.

Copy.—We copy *after* a person; we copy *after* actions. We copy *from* things, as from a picture, or from a statue. In such case, a copy *from* the work is also said to be a copy *after* the artist.

Correspond.—*Correspond*, meaning to hold intercourse by means of letters, is followed by *with*. "I have corresponded with him for several years." *With* is also used with *correspond*, to signify *consistent with*. *Correspond* is frequently followed by *to*, when it expresses adaptability or appropriateness. "His style of living corresponded to his means."

Cover over.—"He covered it over." Say "he covered it."

Dead corpses.—"Evil spirits are not occupied about the dead corpses of bad men." Omit *dead;* it is implied in *corpses*.

Dependent.—"He is dependent *of* his father." Say "dependent *on*." But with independent say *of*.

Derogate.—Say derogate *from*, derogatory *to*, "derogation *from*," or *to*.

Depot, Station.—A *depot* is properly a place where goods or stores are kept. The place where a railway train stops for passengers may better be called a *station*.

Did, Done.—"Who done it?" Say "who did it?" "who has done it?"

Differ.—We differ *with* a person in opinion. One differs *from* another in other respects. The English barbarism of *differ to, different to*, is intolerable, and reverses the meaning of the word *to*.

Direct, Address.—We *address* a letter to a person. We *direct* it to his post office, to the point at which, or to the person through whom, he will receive it. A letter *addressed* to the president may be *directed* to his secretary.

Disappointed, Agreeably Disappointed.—It is better to say *agreeably surprised*. The meaning most closely associated with *disappointment* is that it is not agreeable.

Dissent.—We dissent *from*, not *with*.

Distinct, Distinctly.—"The girl speaks distinct." Say "speaks distinctly."

Divide.—We divide things *between* two, *among* many.

Drank, Drunk.—"He was very thirsty, and drunk eagerly." Say "drank." "He has drank three glasses of soda water." Say "has drunk." "Drunken," the ancient form of the participle, is not now used.

Drove, Driven.—"They have drove very fast." Say "they have driven." But, using the imperfect, say "They drove the people out, and locked the gates."

Dry.—"I am dry, let me have a glass of water." Say "I am thirsty." Using *dry* in this sense suggests the dramshop.

Each, Either.—"A row of trees stood on either side of the river." The use of *either* in such cases is disapproved by some writers, but it is sanctioned by long and unexceptional usage, and by the deliberate judgment of well-informed critics. The use of *each*—"a row of trees stood on each side of the river" is indisputably correct.

Each, Every, Either are singular, and take the verb in the singular number. Such errors as the following should be guarded against: "Each of the daughters take an equal share." Say "takes." "Every leaf, every twig, every blade, every drop of water, teem with life." Say "teems." Also, instead of "one of those houses have been sold," say "has been sold."

Eat, Ate, Eaten.—Say "I ate my breakfast at five o'clock this morning," not "I eat it," or "I et it." "I have eaten my dinner," not "I have ate it," or "I have et it."

Either is followed by *or*. "I shall either send it or bring it myself."

Either and Neither are used when two objects are mentioned, or two assertions are made; when there are more than two objects or assertions, they need not be employed. In such case, instead of *either*, no pronoun or conjunction need be used; instead of *neither*, *no* or *not* may be employed. When two persons are mentioned, "Either you or I must go." In case of three persons, "You or I or John must go." With two assertions, negative, "He will neither do it himself nor let any one else do it." With three negative assertions, "He will not publish the accounts of his office, or allow the public access to them, or permit them to be examined by competent, impartial parties." Usage on the last point is not uniform. Very many good writers use *neither, nor, nor*, with three or more negative assertions.

Emigrant, Immigrant.—An *emigrant* is a person who goes out from a country or a state to reside in another; an *immigrant* is one who comes into the state to live, from abroad.

Equally as.—*As* should not be used after *equally*. Say *equally high, equally dear, equally handsome*, etc.; not *equally as high, equally as dear, equally as handsome*.

Equally as well as.—"I can do it equally as well as he." Omit *equally;* it is implied in the words *as well as*.

Equally the same.—"It is equally the same." Say "it is the same."

Everybody, Anybody.—Refers to male and female.

For want of a pronoun of common gender, use the masculine—he, his, him—unless the other sex is specified. "They" is plural and must not be used.

Anybody can do what they like. (wrong.)

Anybody can do what he likes.

Everybody will have to make up their minds. (wrong.)

Everybody will have to make up his mind.

Everybody has their faults. (wrong.)

Everybody has his faults.

If anybody calls, let them wait. (wrong.)

If anybody calls, let him wait.

Exceeding, Exceedingly.—"He was exceeding kind to me." Say *exceedingly kind.* "She was exceeding careful." Say *exceedingly careful.*

Except, Unless, are often used confusedly. "I shall go except I am ill." Say "unless I am ill." "I saw them all unless two or three." Say "except two or three." The correct usage is easily learned by observing that *except* should be used as a preposition, *unless* as a conjunction.

Fall.—We fall *under* reproach, notice, censure, etc. We fall *from* our friends, *from* virtue; we fall *upon* our enemies, *among* evil associations, *into* bad habits.

Farther, Further. — *Farther* refers to space; *further* to time, degree, and extensions of thought. The distinction is not a necessary one, but it is now very generally observed.

Fewer, Less.—*Fewer* relates to numbers, *less* to quantities. "No man had less friends," should be fewer friends. But say *less* money, *less* strength, etc.

Few, Little, Many, Much.—*Few* and *many* refer to number; *little* and *much* to quantity. In speaking of articles that are rated by counting, use *few* and *many;* in speaking of articles which are rated by measure, use *little* and *much.* "A few potatoes," "so many days."

First.—"The *two first*" should be "the *first two.*" There can be only one first.

Fluent, Fluently.—"He speaks very fluent." Say *very fluently.*

Forward, *backward, toward, upward, onward, downward, hitherward, thitherward, afterward, heavenward, earthward,* etc., should be written without the final *s* which is often added to them.

Funeral obsequies.—Say *obsequies.* The sense of *funeral* is contained in this word. It would be as proper to speak of a "wedding marriage-ceremony" as of "funeral obsequies."

Generally, *always, never, often, rarely, seldom, sometimes,* are adverbs which generally come before the verb.

Gentleman friend, Lady friend.—Instead of "my gentleman friend," say "my friend Mr. ——." Instead of "my lady friend," say "my friend Miss ——," or Mrs. ——.

Gentleman, Lady.—These titles have been applied without discrimination till they have lost almost all the meaning they once had. Many persons have ceased to use them entirely, and employ *man* and *woman* as good enough titles for anybody. There are no nobler titles than *man, woman;* no higher expressions for qualities of grace or virtue than *manly, womanly.*

Get.—"I am afraid Mary is getting crazy." Say "is growing," or "is becoming crazy." "John got left by the train." Say "was left." We *get* anything that we come in possession of. We may also *get* a disease. But *get* must be followed by a noun as its object.

Good for Well.—"He can do it as good as any one else can." Say *as well.*

Got.—I have a pen. Not I have *got* a pen.

Gratuitous.—"That is a gratuitous assumption." It is better to say "unfounded," "unreasonable," or "unwarranted."

Guess.—*Guess* is commonly used in the United States to mean *think,* as in "I *guess* you are right" for "I *think,*" etc.

Had ought.—Provincial and incorrect. *Had* or any form of the verb *to have* cannot correctly be used as an auxiliary with *ought.* Use *should* or *ought not.* Not "He *hadn't ought* to have gone," but "He *should not* have gone."

Hain't.—A vulgarism. There is no such contraction for *have not* or *has not.*

Hang, Hanged.—The verb *hang* has two forms for the past participle, *hanged* and *hung. Hanged* is used for persons; *hung* for other objects. "The man was *hanged.*" "The coat was *hung* on the rack."

He, Him.—It is him whom.—"It is him whom you said it was." Say "it is he."

Healthy, Healthful.—That is *healthy* which is in good health; that is *healthful* which promotes health. "Bread and milk is a healthful food which makes healthy children."

I and Me. — "They went with James and I." Say "with James and me."

If I was.—Use the subjunctive in all cases where the conditions are contrary to fact. "If I *were* you, I should go." "If I *were* a man, I should practice law." I am not you, and I am not a man. Use the indicative in cases of uncertainty. "If I *was* in town that day, I did not see you." I am uncertain as to whether I was or not.

In, Into.—Use *in* to signify rest in a place; use *into* to signify motion toward a place. "He was standing with his hands *in* his pockets." "I put my hands *into* my pockets." "I came *in* an automobile." "The stranger walked *into* the room."

Indeterminate possessive.—"Every child should obey their parents." Say "his parents." "No one should incur censure for being careful of their good character." Say *his,* or *her* if talking more particularly of women. "Let each of us mind their own business." Say "his own business." *Their* is frequently used improperly, as a substitute. In such cases, *his* or *her* should be used, according as the object most prominent in the expression, or in the speaker's thought, is masculine or feminine. In cases of doubt or indifference, use *his* In the nominative we may say *one.* But in the possessive and objective we must say *his, him* or *her.*

Indifferent, Indifferently.—"He was indifferent honest." Say *indifferently honest.*"

Infinitive.—See Split Infinitive.

Ingenuous, Ingenious.—*Ingenuous* is simple, honest, open, unaffected. *Ingenious* is skillful, versatile, ready in contriving.

Jew, Hebrew, Israelite.—A *Jew* is a member of the Hebraic division of the Semitic race; in consequence *Hebrew* is the linguistic name of the *Jews.* Historically, under the theocracy, they were known as *Hebrews;* under the monarchy, as *Israelites;* and during foreign domination, as *Jews.* The modern representatives of this stock call themselves *Hebrews* in race and language, and *Israelites* in religion, but *Jews* in both senses.

Jewelry, Jewels.—*Jewelry* is a collective noun, and *jewels* is a plural noun. In nice usage the term *jewelry* designates the stock of a jeweler; *jewels,* the articles of adornment worn by a lady.

Join issue and Take issue.—In nice usage, "*join* issue" means *to admit the right of the denial of a statement.* "*Take* issue" means merely *to deny.*

Kind of should not be used for *somewhat.* Instead of "I am *kind of* tired," one properly says, "I am *somewhat* tired."

Kind of a.—A is superfluous in such constructions as, "What *kind* of man is he?" (not "kind of *a*"). The same rule applies to *sort.*

Kind and Kinds.—See *These* and *This.*

Know, Knew, Known.—"I knowed it." Say "I knew it." "I have knowed it all along." Say "I have known it."

Latter end.—"I expect to get through by the latter end of the week." Say "by the end of the

week." "The latter end of that man shall be peace." Say "the end of that man."

Learn, Teach. — These words are often confounded. The pupil *learns*, the instructor *teaches*. One person cannot *learn* another, but must *teach* him.

Leave, Lief.—Say "give me leave to tell you," not *lief*. But "I would as lief do it as not," not *leave*.

Leisure upon one's hands.—"If you have any leisure upon your hands." Say "if you are at leisure."

Lend, Loan.—"Loan me five dollars." Say "lend me five dollars." The money having been lent him, the borrower has obtained a *loan* of that sum, or has borrowed it.

Lengthways, Sideways, Otherways. — These forms are erroneous. Say, and write, *lengthwise*, *sidewise*, *otherwise*.

Lie, Lay.—Distinguish between the verbs:—

lie—to tell lies

Present Tense—He lies like truth.
He is lying.

Past Tense—But he lied unto him.
Wherefore have ye lied to me?
Why have you been lying to me?

lie—to lie down

Present—The dog lies under the table.
The dog is lying under the table.

Past—He lay upon the bed.
He has lain there for hours.
He has been lying there for hours.

lay—to put a thing down

Present—The boy lays his books on the table.
The boy is laying his books on the table.

Past—He laid his head upon the block.
The hen has laid an egg.
The hen has been laying all the winter.

Liable, Apt.—*Apt* means fit, ready, quick to do a thing, or to be subjected to certain conditions. It generally implies willingness. *Liable* signifies bound to duties, subject or exposed to inconveniences or dangers, and implies no regard to the will of its subject. "John will be apt to catch the fever if he goes into that house," should be "John will be liable," etc. A person who is studious may be spoken of as *apt* to learn, and *liable* to become dyspeptic.

Like.—"We don't do that like you do." Say "as you do." This misuse of *like* is common with English women novelists. *As* should be used when a verb follows, or is understood to follow. Where no verb is implied, *like* may be employed.

Like for As.—Like should not be used as a conjunction. Say: "Do as I do," not, "do like I do," or, "do like me."

Like, Love.—*Love* is often used instead of *like*, and is thereby made to lose all its force. We *love* what the heart goes out to, that for which we entertain a fond and lasting affection. We *love* wives, husbands, parents, children, near friends. We *like* what we have a taste for, what pleases us in passing, or what is generally agreeable to us, as acquaintances, sweetmeats, pleasant weather, music, painting, reading. We regret for a long time the loss of what we *love*, we soon cease to be troubled at missing what we *like*.

Limb.—"She fell, and bruised her limb." Say what limb. The arm is a limb, as well as the leg. The foolish shame which avoids mentioning the leg by name, is not modesty, but prudery.

Lit.—Not to be used for *lighted*. Instead of saying "He *lit* the gas," say "he *lighted* the gas." Do not say "He *lit* on his feet," but "he *lighted* on his feet."

Locate.—"I shall locate in Iowa." Say *settle*. *Locate* has acquired a certain technical currency. The purchaser of land warrants *locates* by selecting a particular tract to claim under it. *Place*, *settle*, *fix*, *establish*, can be substituted for it in most cases, and are better.

Mad.—Should not be used for *angry*.

Mail man.—An inelegant form for *postman*.

Me being.—"Me being absent, the young folks lived high." Say "I being absent," or "while I was absent," or "during my absence."

Me, I.—"Is it me you mean?" Say "is it I?" or "do you mean me?"

Me, My.—"In consequence of me neglecting."—"The horse got away in consequence of me neglecting to fasten the gate." Say "in consequence of my neglecting," etc.

Monstrous.—*Monstrous* does not mean large. It means *ill-formed*, *misshapen*, deviating from the course of nature, of a character to inspire unpleasant feelings. But an object so unusually large as to appear terrible may be figuratively styled *monstrous*.

More—than, not *more—as*. "He was *more* beloved but not so much admired *as* his brother." This sentence must be recast.

"He was *more* beloved *than* his brother, but not so much admired." Or,

"Though not so much admired as his brother, he was more beloved."

Mortgagor, Mortgagee.—The *mortgagor* is the debtor, who pledges the property which is in mortgage. The *mortgagee* is the creditor, to whom the mortgage is made.

Most.—Not to be used for *almost;* as "He is here *most* every day."

Mutual.—Does not mean *common*, but *reciprocal*. "We may have a *common* friend, but a *mutual* dislike"; that is, a dislike for each other.

Myself.—Not to be used for *I*. Do not say "John and *myself* are friends"; but "John and *I*," etc.

Near, Nearly.—"I lost near twenty pounds." Say "nearly twenty pounds."

Neither for Either.—"That is not the case, neither." Say "either." The double negative is wrong.

Neither, Nor.—Negatives other than neither may take *or* or *nor* as their correlative. With subjects connected by "either—or," "neither—nor," the verb must be singular:—

Neither he nor his brother *were* trained for the ministry.

should be

Neither he nor his brother ***was*** trained for the ministry.

Either the master or his servant was responsible.

Neither ignorance nor negligence has been the cause of his ruin.

New beginner.—Say *beginner*. When one begins anything, he is new at it of course.

Nice.—A very generally misused word. Properly *nice* means *delicate*, *discriminating*, *fastidious*. The works of a watch show *nice* construction; a man may be *nice* in his manners. The word should not be used to mean *agreeable* or *charming* as "I had a *nice* time."

Nicely.—Do not use *nicely* for *well*, as "The sick man is doing *nicely*."

Nobody else.—"There was nobody else but him." Omit *else*.

No for Not.—"I cannot tell whether this is correct of *no*," is wrong. Say, "I cannot tell whether this is correct or *not*."

None, is the same as no one, and is properly singular. It is, however, used in both numbers, according as the context seems to make appropriate.

Not as I know of.—Incorrectly used for *not that I know of*.

Not me.—"Who made that noise?" "Not me." Say "not I." "It wasn't me." Say "it wasn't I." The use of *me* is defended by some writers.

Not only—but also.—Correlatives must be placed immediately before the words connected.

"He *not only* lent me his horse *but also* sent his carriage."

"He lent me *not only* his horse *but also* his carriage."

Number, Quantity.—*Number* should be used in

speaking of objects that are counted, *quantity* with those that are measured. *Much, little,* and *less,* answer to quantity, and *many, few,* and *fewer,* to numbers; *more* answers to both.

Of.—"A child of four years old." Say "a child four years old," or "a child of four years."

Off of.—"There were ten yards of the cloth before I cut this piece off of it." Say "before I cut this piece off it," or "from it."

One.—*One* is the only singular personal pronoun of common gender.

"*One* must not forget *one's* duty to *one's* country." This frequent repetition is disagreeable.

"No man must forget his duty to his country."

"A man must not forget his duty to his country."

Only is best placed immediately before the word it modifies. In case there can be no ambiguity it may be placed immediately after the word it modifies.

Only I wrote to him to-day. (No one else wrote.)

I *only* wrote to him yesterday. (I did not telephone.)

I wrote *only* to him to-day. (I wrote to no one else.)

I wrote to him *only* to-day. (No longer ago than to-day.)

I wrote him to-day *only.* (I had not written before.)

This car for members *only.* (For none but members.)

Only, Alone.—"He alone can do it," implies that he can do it without help. It would be better, "He can do it alone." "He only can do it," signifies that he, and no other person, can do it. Using *alone* in the sense of *only* may lead to ambiguity.

Onto.—We get *on* a horse and *on* a chair, not *onto.*

Orate.—An unauthorized form commonly used to mean *to give an oration.*

Over.—Do not use *over* in the sense of *more than;* as, "I have *over* a hundred dollars"; "The stick is *over* a yard long."

Over a bridge.—"He went over the bridge." It is more exact to say, "he went across the bridge." A bird may fly *over* a bridge, if it does not touch the bridge.

Overhead and ears.—"We went in overhead and ears." Say *overhead.* The head carries the ears. But "overhead and ears in debt" is a phrase which it will be hard to abolish.

Partial, Partially.—"This view is partially correct." "Partly correct," or "in part correct," is better. *Partially* means, properly, one sided, with bias.

Persuasion, in the sense of religious denomination or belief, is objectional. *Sect, denomination, belief,* or "school of belief," are proper substitutes.

Plunge down.—"He plunged down into the stream." Omit *down.*

Possessives.—

Rule.—Use the apostrophe and the letter *s* (or change the form) only when the noun (or pronoun) itself represents the possessor.

This is a photograph *of* my uncle.

She is a servant of my *aunt's.*

This is a criticism *of John.* (Some one else wrote it about John.)

This is an opinion *of John's.* (John's opinion; that is, John uttered it.)

This is an opinion *of John.* (Some one else uttered it.)

Plural and Singular Words.—*Molasses* is singular. The habit of giving it a plural construction is an error. Say "that molasses is souring," not "them molasses are souring."

Words like *scissors, snuffers, tongs, trousers,* etc., denoting articles which are paired or coupled, are plural, and take a plural verb. "The scissors are dull," not "is dull."

This is the birthplace of the President. (Not President's.)

This is the private office of the Secretary. (Not Secretary's.)

He is a friend *of the Bank's.* (One of several friends.)

He is an enemy *of mine.* (One or more possessed by me.)

He is a brother *of mine.* (One or more possessed by me.)

He is a friend *of hers.* (One or more possessed by her.)

I cannot endure that rasping voice *of Bridget's.* (One voice.)

Prepositions.—Never use a preposition to end a sentence:

For whom is that? To whom are you writing? The matter to which I am referring.

Two prepositions should not come together, as: "That is the man I went *to for* advice." But, "That is the man to whom I went for advice."

Previous, Previously.—"He wrote me previous to his coming." Say "previously to his coming."

Quantity, Number.—*Quantity* is used of that which can be measured; *number,* of that which can be counted; as, "There is a large *quantity* of sugar on hand"; "There are a large *number* of eggs in the basket."

In connection with the use of the singular or the plural verb with the word *number,* note that the plural verb is used when *number* means *several;* the singular, when *number* is used to stand for a unit; as, "A *number* of persons *are* going" (several); "The *number is* limited to five."

Quite.—"There are quite a number of Americans here." Say "there are several." One is *quite* a number. It is correct to say "there are quite twenty" to express that the number is completely made up—which is the meaning of *quite.*

Raised.—"I was raised in the South." Say "brought up." "I was raised in Mr. Stephens' family." Say "taken care of," "brought up," "instructed," or "trained." We "raise" horses, cattle, sheep, swine, poultry and crops, but apply a more refining process to human beings.

Ran, Run.—Say "this horse has often run a mile in two minutes and a half; yesterday he ran a mile in two minutes and three-quarters."

Rang, Rung.—"I have rang the bell half a dozen times." Say "have rung." But say in the imperfect, "they rang the bells merrily for Christmas day."

Rather—than, Prefer—to.—"He *preferred* doing nothing *rather than* run the risk of doing wrong," should be "He preferred doing nothing rather than running the risk of doing wrong"; or "He preferred to do nothing rather than to run the risk of doing wrong."

Receipt and Recipe.— One properly says, "The *receipt* calls for three cupfuls of flour," *recipe* being restricted in its use as a medical term. Century gives the following: "*Receipt* is distinguished from *recipe* by the common restriction of that word [*recipe*] to medical and relative uses; as, "A *receipt* for a pudding."

Reckon.—Provincial for *think.* "I *reckon* he will come soon." Say "I *think*" or "I *believe.*"

Reference, Recommendation.—A person seeking employment or position, names certain persons who know him as his *references.* They may, if they are so disposed, and can do so with truth, give him their *recommendation.*

Regard.—"In regard *of* this matter." Say "in regard *to,*" or "with regard *to.*"

Regarded *from* that standpoint, but looked at *in* that light.

Relations, Relatives, Kin, Kindred.—It is better to speak of ones *relatives* than of his *relations. Relations* has other meanings. *Kin* and *kindred* are old English words, which deserve to be more in fashion than they are.

Relative Pronouns.—*Who* is used exclusively with persons, *which* exclusively with things, and *that*

with persons and things. In common conversation *that* is more frequently used with persons than *who*. But *who* is considered more elegant.

Examples of the correct use of the relative pronouns, *who*, *which*, *that*, and *what:*

I gave the money to the driver, *who* will give it to his employer.

I brought her a book, from the library, *which* she enjoyed very much.

This is the house *that* she bought.

I do not want you to repeat *what* I have told you.

(1) In the last sentence *what* is equivalent to *that which* or the *thing which*. It differs from the other relative pronouns in that *its antecedent is never expressed*, it being implied in the word itself (that which).

(2) *What* is always of the neuter gender, and is used in only the nominative and the objective case. *Who*, *whose*, and *whom* are either masculine and feminine (common gender) and are used, respectively, in the nominative, the possessive, and the objective case.

(3) *Which* is neuter and may be used in either the nominative or the objective case.

(4) *Whose* is the form of the possessive for either *who* or *which*.

Remarkable, Remarkably.—"She is a remarkable pretty girl." Say *remarkably pretty*.

Reside and Live.—The simple word *live* is preferable to *reside* when referring to one's place of residence, *reside* being reserved for more stately occasions.

Respect.—Instead of "in respect of," say "in respect *to*," or "with respect *to*."

Respectfully and Respectively.—*Respectfully* mean in a respectful manner; *respectively* refers to persons or things thought of singly; as, "He behaved *respectfully* toward his parents"; "The names of the boys are, *respectively*, John, Henry, and James.

Rise up.—"He rose up and left the room." Say "he rose"; say also, *raise*, *lift*, *hoist;* not *raise up lift up*, *hoist up*.

Saw, Seen, See.—"I see him last Monday." Say "I saw him." "I seen him yesterday." Say "I saw him." "I haven't saw him for a long time." Say "I haven't seen him." *See* is present, *saw* imperfect, *seen* the participle. The habit of confusing them prevails widely.

Section.—"Mr. —— does not live in this section." Say "in this neighborhood," "vicinity," or "part of the country." A *section*, in geography, is one square mile, or six hundred and forty acres of land, which has been laid out by the government.

Shall and Will.—*Shall* in the first person and *will* in the second and third persons denote mere futurity.

Will in the first person and *shall* in the second and third denote volition.

In asking questions *shall* must always be used with a subject in the first person. In the second and third persons we use *shall* and *will* according to the answers that we expect. When we expect the answer *shall*, we use *shall* in asking the question. When we expect the answer *will*, we use *will* in asking the question.

Similar statements are true of *should* and *would*.

The proper use of *shall*, *will*, *should*, and *would* in indirect discourse may be determined by turning the sentence into the direct discourse and choosing the proper word according to the rule.

With all three persons, we may use *would* to express a wish. Also we may use *would* without regard to future time, to denote that an action is customary; as, "He would often fish for days in succession."

Should is sometimes used in its original sense of *ought;* as, "You should not do that."

The forms given below are examples of the simple future statement.

Examples:

I shall be happy.	We shall be happy.
You will be happy.	You will be happy.
He will be happy.	They will be happy.

If we wish to add the idea of a compelling force, or of determination or obligation, the proper auxiliary for the first person is *will;* for the second and third persons, *shall*.

Examples:

I will go	means I am determined to go.
You shall go	means You must go.
He shall go	means He must go.
We will go	means We are determined to go.
You shall go	means You must go.
They shall go	means They must go.

I shall have satisfaction means that the satisfaction will come in the course of time.

I will have satisfaction means *I am determined to have it.*

Sink down.—"The stone sunk down in the water." Omit *down*.

Some for Somewhat.—"He is some better today." It is better to say "he is somewhat better."

Split Infinitive.—To explain, to thank (infinitive). These words should not be separated (split). "Have the goodness to clearly explain," should be "Have the goodness to explain clearly."

"I want to personally thank you," should be "I want to thank you personally."

Tenses.—In subordinate clauses the tense of the verb is relative to the tense of the principal verb.

"He intended to have done so," should be "He intended to do so."

The imperfect tense, *I did* is used in speaking of events which took place before a time that is past.

The perfect tense, *I have done*, is used in speaking of events which have been completed before the present time.

Than me.—"He is taller than me." The word after *than* should be in the same case with the word before it.

Than him.—"You are stronger than him." Say "than he."

That.—See Relative Pronouns.

Thee and You.—"I owe thee a heavy debt of gratitude, and you will not permit me to pay it." Avoid such confusion of numbers. Use the same word—either *thee* or *you*—in both clauses.

Them, They.—"It was *them*." Say "it was they."

These, This.—I don't like *these sort* of folks (this sort).

Those kind of boots—that kind (those kinds).

These kind, Those sort.—*Kind* and *sort* are singular nouns, and should be modified by singular adjectives. Say "*this kind*," "*that sort*."

They, Everyone.—Do not use *they* indefinitely instead of *everyone*, as, "They are always in a hurry in the city"; better say "Everyone is in a hurry in the city."

Though is followed by *yet*. "Though he was rich, yet for our sakes he became poor."

Through.—Often misused in the sense of *finished*. "I am *through* with my breakfast," instead of "I have *finished* my breakfast."

To be.—The verb "to be" takes the same case after it as before it. Example: "Who is there?" "It is I." Say "It was I who rang the bell."

Trousers, Waistcoat, Gown, Petticoat, are good old respectable English words, which point out particular garments without possibility of mistake. They are better than the new ones, *pantaloons*, *vest*, *dress*, *skirt*.

Try and.—"I will try and do it." Say "I will try to do it."

Unique is not properly modified by *very*, *unique* meaning the only one of its kind.

Use to.—*Used to*, not *use to*, is the correct form; as, "*I used to go* there very often." In negative constructions "didn't used to" is always incorrect.

View to and View of.—One properly says, "With *a view to* finding out." or "With *the view of* finding out."

Visit with.—*Visit* is improperly followed by *with* in such constructions as, "I am *visiting with* friends in New York," "I am visiting friends," etc., being the correct form.

Vocation.—A man's *vocation* is his calling, his regular business. His *avocation* is something outside of his business with which he occupies himself incidentally. My friend's *vocation* is the practice of law; his *avocation* is photography. Still, while *avocation*, in the sense of *vocation*, is usually avoided by good writers, such use has some sanction of authority.

Want.—Avoid *want* in the sense of "ought" or "had better," as, "You want to hurry if you are going to catch the car"; better say "You had better hurry if you expect to catch the car."

Was, Were.—"Was you?" "You was." Say "were you?" "You were."

Way, Away.—*Way* should not be used for away. "I saw him away (not way) down the road."

What for Who, Which, and That.—See Relative Pronouns.

Where for In which.—"It is a cause where justice is particularly concerned." Say *in which*. "We persented a paper where his case was fully explained." Say "a paper in which." But *where* may be used instead of *which* and a preposition when place is the predominant idea. "The old house where I was born."

Whether is followed by *or*. "Whether he will go or not, I cannot tell."

Which.—See Relative Pronouns.

Who.—See Relative Pronouns.

Without, Unless.—*Without* must not be used for *unless*. "You won't catch the train *without* you run," should be, "You won't catch the train *unless* you run."

"My uncle would not take me *without* my mother wished it," should be "My uncle would not take me *unless* my mother wished it."

Wrong and Wrongly.—*Wrong* is an adverb as well as an adjective. For this reason, *wrong* is often interchangeably used with *wrongly;* as, "The mail was sent off *wrong*" (or *wrongly*). When preceding the verb, *wrongly* is required; as "The letter was *wrongly* addressed."

USE OF CAPITAL LETTERS

The following are the general rules for the use of capitals, together with the abbreviations most commonly used. Many special uses of capital letters are also insisted upon by writers which cannot be reduced to general rules.

Rule I.—The first word of every sentence should begin with a capital letter.

A sentence preceded by an introductory word or clause such as Resolved, Be it enacted, etc., begins with a capital notwithstanding the introductory word.

Rule II.—The first word of a direct quotation, of an important statement, and of a direct question, should begin with a capital.

Examples:

One truth is clear: Whatever is, is right.—*Pope*.

Ask yourselves this question: Are you doing right?

Rule III.—The first word of every line of poetry should begin with a capital.

Rule IV.—All proper names begin with capitals. If the proper name consists of several words, all are capitalized except articles, prepositions, and conjunctions.

Examples:—San Diego, Burton-on-Trent, the Grand Army of the Republic.

The words *street, road, lake, river, mountain*, etc., should begin with capitals when used in connection with proper names.

Examples:—Crawford Road, Prospect Street, Lake Erie, Cuyahoga River, Little Mountain.

North, South, East, and *West*, should begin with capitals when they mean sections of the country and not points of the compass.

Example:—Chicago, the largest city of the West, is south of Lake Michigan.

Capitalize *city* only when part of the corporate name, *New York City, Washington City*.

Rule V.—Names of days and months always take a capital; but the names of seasons of the year are not commonly capitalized.

Rule VI.—Titles of office before personal names, and other titles so placed which are not mere common names of vocation, are written with capitals.

Examples:—*Senator Jones, Doctor* (or *Dr.*) *Brown, Aunt Jane, Miss* or *Master Gray;* but *coachman Smith, barber Harris*, etc.

Titles of dignity are also commonly capitalized when used alone, as in address, or with the definite article.

Examples:—*the President, Senator, Judge, the Judge, District Attorney*.

When title, with or without Christian name, precedes "de," use lower-case "d"; this rule applies also to "la," "di," "von," "van," etc.

Examples:—*Marquis de Lafayette, Di Cesnola, Prince von Moltke, Von Humboldt, Dr. la Mond, De Chaulnes, Mr. van Renssalaer*.

Rule VII.—Many special names of a common kind are, in particular uses, treated as proper nouns and capitalized.

Examples:—*Congress, Parliament, Senate, House of Representatives, State* (for one of the United States), *Hudson River Railroad, Aldine Printing Company*.

Capitalize the names of political parties; as, *Republican Party, Democratic Party, Progressive Party*, etc.

Capitalize *Christmas Day, New Year's Day, Lincoln's Birthday, Washington's Birthday, Good Friday, Decoration Day* or *Memorial Day, Fourth of July, Labor Day, Election Day, Thanksgiving Day*, etc.; a noted day, as *Black Friday*, etc.; but *blue Monday*.

Capitalize *Northerner, Southerner, Northern gentleman, Southern blood*, etc.

Capitalize names of important events and periods; as, *the Creation, the Fall, the Flood, the Reformation, the Revolution* (French or American), *Civil War* (American), *the Middle Ages, the Union, Reconstruction*.

Capitalize religious denominations; as, *Methodist Episcopal Church, St. Mark's Church, Church and State*, etc.

Church is without the capital always when used alone or when meaning congregation or building; as, *a Methodist church in Hoboken*.

Capitalize *College, Club, Society*, etc., when referring to that particular body, in by-laws, proceedings, or other publications of a college, club, society, company, etc.

Capitalize *Monsieur, Madame, Signor*, etc.

Capitalize *State* only when referring to one of the United States.

Rule VIII.—Adjectives and nouns derived from proper names are written with capitals.

Examples:—*Jacksonian, New Yorker, Congressman* (if *Congress* has a capital).

Names of countries and places, and adjectives derived from them.

Examples:—a German dictionary. The best Spanish wines.

But such words used in some other common way are not capitalized.

Examples:—morocco leather, russia leather, india rubber, plaster of paris, etc.

Rule IX.—Names of families and larger groups in natural history, and of genera, are written with capitals; also botanical specific names derived from proper names, and those that have formerly been genus-names, though zoölogical usage gives a small initial to every specific name.

Examples:—*Asplenium Trichomanes* (a fern). *Menticirrhus americanus* (a fish). *Carya alba* (a hickory tree).

Rule X.—In headings the important words only should be capitalized.

Titles of books, newspapers, plays, and the like, are written with capitals beginning the important words, most commonly nouns, principal verbs, adjectives, and adverbs. The word *the* is capitalized as part of the title if the title is quoted exactly.

Examples:—A History of the Rebellion.
Free Trade and Protection.
Put Yourself in his Place.
Milton's Select Poems.
The Beginnings of Poetry.

Rule XI.—The pronoun *I* and the interjection *O* are capitalized.

Rule XII.—All names of God, all words that may be regarded as titles of the Deity, should begin with capitals.

Rule XIII.—In compound words, as vice-president, ex-president, etc., the prefix (vice) should not be capitalized.

Rule XIV.—In personification it is usual to capitalize the personified words.

Examples:—
Vice is a monster; smiling Spring.
The Voice of Nature; but: true to nature.

ABBREVIATIONS, CONTRACTIONS AND DEGREES

Military or naval and some professional titles preceding names are nearly always abbreviated; as *Capt. Jones, Dr. Brown, Rev. Dr. Smith.*

Titles of collegiate degree are abbreviated; as, *William Lee, Ph. D., LL. D.*

In general writing, it is better to avoid abbreviation as far as possible.

A., *a.* Adjective.
A. Alto.
A., *ans.* Answer.
a., @ (Lat. *ad*). To; At.
ā, *āā*. The like quantity of each.
A. A. A. S. American Association for the Advancement of Science.
A. B. (Lat. *artium baccalaureus*). Bachelor of Arts.
Abbr., *Abbrev.* Abbreviated, Abbreviation.
Abl., *ablat.* Ablative.
Abp. Archbishop.
A. C. (Lat. *ante Christum*). Before Christ; Analytical Chemist.
Acad. Academy.
Acc., *Accus.* Accusative.
Acc., *Acct.* Account.
A. D. (Lat. *anno Domini*). In the year of our Lord.
A. D. C. Aide-de-camp.
Ad., *advt.* Advertisement.
Adj. Adjective.
Adjt. Adjutant.
Adjt. Gen. Adjutant-General.
Ad lib., *Ad libit.* (Lat. *ad libitum*). At pleasure.
Adm. Admiral.
Admr. Administrator.
Admx. Administratrix.
Adv. Adverb.
Æ., *Æt.* (Lat. *ætatis*). Of Age, Aged.
A. G., *Agt.-Gen.* Adjutant-General.
Ag. (Lat. *argentum*). Silver.
Agl. Dept. Agricultural Department.
Agr., *Agric.* Agriculture, Agricultural.
Agt. Agent.
A. L. of H. American Legion of Honor.
Al., *Ala.* Alabama.
Alas. Ter. Alaska Territory.
Ald. Alderman.
Alex. Alexander.
Alf. Alfred.
Alg. Algebra.
A. M. (Lat. *anno mundi*). In the year of the world.
A. M. (Lat. *ante meridiem*). Before noon.
A. M. (Lat. *artium magister*). Master of Arts.
Am., *Amer.* America, American.
Amer. Phil. Soc. American Philosophical Society.
Amt. Amount.
an. (Lat. *anno*). In the year.
Anal. Analysis.
Anat. Anatomy, Anatomical.
Anc. Ancient.
Anon. Anonymous.
Ans. Answer.
Ant., *Antiq.* Antiquities, Antiquarian.
Anthrop. Anthropology, Anthropological.
A. O. U. W. Ancient Order of United Workmen.
Ap., *App.* Apostle, Apostles.
A. P. A. American Protestant Association; American Protective Association.
Apoc. Apocalypse, Apocrypha.
Apog. Apogee.
App. Appendix.
approx. Approximate, -ly.
Apr. April.
Aq. (Lat. *aqua*). Water.
Ar. Arab. Arabic, Arabian.
A. R. A. Associate of the Royal Academy.
Arab. Arabic, Arabian.
Aram. Aramaic.
Arch. Architecture.
Archæol. Archæology.
Archd. Archdeacon.
Arith. Arithmetic, Arithmetical.
Ariz. Arizona.
Ark. Arkansas.
Art. Article.
A. S., *A.-S.* Anglo-Saxon.
Asst. Assistant.
A. S. S. U. American Sunday School Union.
Assyr. Assyrian.
Astrol. Astrology.
Astron. Astronomy, Astronomical.
Atty. Attorney.
Atty.-Gen. Attorney-General.
A. U. A. American Unitarian Association.
A. U. C. (Lat. *anno urbis conditæ*). In the year from the building of the city—Rome.
Aug. Augustus; August.
Auxil. Auxiliary.
Avoir. Avoirdupois.
B., *Brit.* British.
b. Born.
B. A. Bachelor of Arts [*A. B.*]
Bal. Balance.
Balt., *Balto.* Baltimore.
Bap., *Bapt.* Baptist.
Bar. Barrel, Barometer.
Bart., *Bt.* Baronet.
bbl., *bbls.* Barrel, Barrels.
B. C. Before Christ.
B. C. L. (Lat. *baccalaureus civilis legis*). Bachelor of Civil Law.
B. D. (Lat. *baccalaureus divinitatis*). Bachelor of Divinity.
Bd. Bound.
Bdls. Bundles.
B. E. Bachelor of the Elements; Bachelor of Elocution.
Belg. Belgic, Belgian.
Ben., *Benj.* Benjamin.
Bib. Bible, Biblical.
Biog. Biography, Biographical.
Biol. Biology, Biological.
B. L., *B. L. L.* (Lat. *baccalaureus legum*). Bachelor of Laws.
B. ès L. (*F. Bahcelier és Lettres*). Bachelor of Letters.
bls. Bales.
B. M. (Lat. *baccalaureus medicinæ*). Bachelor of Medicine.
B. M., *B. Mus.* (Lat. *baccalaureus musicæ*). Bachelor of Music.
B. O. Branch Office.
B. O. Bachelor of Oratory.
Boh. Bohemian or Czech.
Bot. Botany, Botanical.
Bp. Bishop.
Br., *Bro.* Brother.
Brig. Brigade.
Brig.-Gen. Brigadier-General.
Brit. Britain, Britannia, British.
B. S. Bachelor of Surgery; Bachelor of Science.
B. Sc. (Lat. *baccalaureus scientiæ*). Bachelor of Science.
Bt. Baronet.
bush. Bushel.
B. V. Blessed Virgin.
B. V. M. Blessed Virgin Mary.
bx., *bxs.* Box, Boxes.
C. Cent, Cents; Centigrade; Consul; Centime, Centimes; a hundred.
C., *Cap.* (Lat. *caput*). Chapter.
C. A. Chartered Accountant.
Cal. California; Calendar.
Cant. Canticle.
Cantab. (Lat. *Cantabrigiensis*). Of Cambridge.
Cap. (Lat. *caput*). Capital; Chapter.
Caps. Capitals.
Capt. Captain.
Card. Cardinal.
Cath. Catharine; Catholic.
C. D. V. Carte-de-Visite.
C. E. Civil Engineer.
Celt. Celtic.
Cent. (*centum*). A hundred; Centigrade.
Centig. Centigrade.
Cert., *Certif.* Certify; Certificate.
Cf. (Lat. *confer*). Compare.

ABBREVIATIONS CONTRACTIONS AND DEGREES—Continued

C. ft. Cubic feet.
C. G. Coastguard; Commissary-General.
C. G. S. Centimetre-Gramme-Second.
C. H. Court House.
Ch. Church; Chapter.
Chal., *Chald.* Chaldee.
Chan. Chancellor.
Chap. Chapter.
Chas. Charles.
Chem. Chemistry, Chemical.
Ch. Hist. Church History.
Chr. Christ; Christian; Christopher.
Chron. Chronology, Chronological.
Cit. Citation; Citizen.
Civ. Civil.
C. J. Chief Justice.
Class. Classical.
Clk. Clerk.
cm. Centimetre.
C. M. Certified Master; Common metre.
C. M. (Lat. *chirurgiæ magister*). Master in Surgery.
C. M. G. Companion of the Order of St. Michael and George.
Co. Company; County.
C. O. D. Cash on delivery; Collect (payment) on delivery.
Col. Colonel; Colossians; Column.
Colloq. Colloquial; Colloquialism; Colloquially.
Colo. Colorado.
Com. Commander; Commerce; Commissioner; Committee; Commodore; Common.
Comm. Commentary; Commerce.
Comp. Compare; Comparative; Compound, Compounded.
Con., *contra* (Lat.). Against.
Con. Cr. Contra Credit.
Cong. Congregation, Congregational, Congregationalist; Congress.
Conj. Conjunction.
Conn. Connecticut.
Contr. Contracted, Contraction.
Cop., *Copt.* Coptic.
Cor. Corinthians.
Cor. Mem. Corresponding Member.
Corrup. Corruption, Corrupted.
Cor. Sec. Corresponding Secretary.
Cos. Cosine.
C. P. Clerk of the Peace; Common Pleas.
C. P. A. Certified Public Accountant.
C. P. C. Clerk of the Privy Council.
C. P. S. (Lat. *custos privati sigilli*). Keeper of the Privy Seal.
C. Q. D. Come quick—danger.
Cr. Credit, Creditor.
C. R. (Lat. *Civus Romanus*). Roman Citizen.
C. R. (Lat. *custos rotulorum*). Keeper of the Rolls.
Cres. Crescendo.
Crystall., *Crystallog.* Crystallography.
C. S. A. Confederate States of America.
C. S. Court of Sessions, Clerk to the Signet.
Csks. Casks.
Ct. (Lat. *centum*). A hundred.
Ct. Court.
Ct., *Conn.* Connecticut.
C. T. A. U. Catholic Total Abstinence Union.
Cu. (Lat. *cuprum*). Copper.
Cub., *Cu. ft.* Cubic, Cubic foot.
Cur., *Curt.* Current—this month.
Cwt. A hundredweight; Hundredweights.
Cyc. Cyclopædia.
d. (Lat. *denarius*, *denarii*). A penny, Pence.
d. Died.
Dan. Daniel; Danish.
Dat. Dative.
Dav. David.
D. C., *Dist. Col.* District of Columbia.
D. C. L. Doctor of Civil (or Canon) Law.
D. D. (Lat. *divinitatis doctor*). Doctor of Divinity.
D. D. S. Doctor of Dental Surgery.
D. E. Dynamic Engineer.
D. Eng. Doctor of Engineering.
Dec. December.
decim. Decimetre.
Def. Definition.
Deft. Defendant.
Deg. Degree, Degrees.
Del. Delaware.
Dep., *Dept.* Department.
Dep. Deputy.
Der. Derived, Derivation.
Deut. Deuteronomy.
D. G. (Lat. *Dei gratia*). By the grace of God.
Dict. Dictionary.
Dim., *Dimin.* Diminutive.
Dis. Disct. Discount.
Dist. District.
Dist. Atty. District Attorney.
Div. Divide; Dividend; Division; Divisor.
D. Lit., *D. Litt.* Doctor of Literature.
D. L. O. Dead Letter Office.
D. M., *D. Mus.* Doctor of Music.
D. M. D. Doctor of Dental Medicine.
D. O. Doctor of Osteopathy; Doctor of Optics.
Do. (Ital. *ditto*). The same.
Dols. Dollars.
Doz. Dozen.
Dpt. Deponent.
Dr. Debtor; Doctor; Dram, Drams.
Dram. Dramatic, Dramatically.
D. Sc. Doctor of Science.
D. T. (Lat. *doctor theologiæ*). Doctor of Theology.
Du., *Dut.* Dutch.
Dub. Dublin.
Duo. 12*mo.* Duodecimo (twelve folds).
D. V. (Lat. *Deo volente*). God willing.
D. V. M. Doctor of Veterinary Medicine.
D. V. S. Doctor of Veterinary Surgery.
Dwt. (Lat. *denarius*, an English *weight*). Pennyweight, Pennyweights.
Dynam. Dynamics.
E. East, Eastern; English; Edinburgh.
Ea. Each.
Eccl., *Eccles.* Ecclesiastical.
Econ. Economy.
Ed. Editor; Edition; Edinburgh.
Ed., *Edm.* Edmund.
Edin. Edinburgh.
Edw. Edward.
E. E. Electrical Engineer.
e. g. (Lat. *exempli gratia*). For example.
Elec., *Elect.* Electric, Electricity.
Eliz. Elizabeth, Elizabethan.
Emp. Emperor, Empress.
Ency., *Encyclo.* Encyclopædia.
E. N. E. East-northeast.
Eng. England, English.
Eng., *Engin.* Engineer, Engineering.
Eng. Dept. Department of Engineers.
Ent., *Entom.* Entomology, Entomological.
Env. Ext. Envoy extraordinary.
Eph. Ephesians; Ephraim.
Epiph. Epiphany.
Epis. Episcopal.
Epist. Epistle, epistolary.
Eq. Equal, equivalent.
Equiv. Equivalent.
Esd. Esdras.
E. S. E. East-southeast.
Esq., *Esqr.* Esquire.
et al (Lat. *et alibi*). And elsewhere.
et al. (Lat. *et alii*, or *aliæ*, *alia*). And others.
etc., *&c.* (Lat. *et cæteri*, *cæteræ*, or *cætera*). And others, and so forth.
Ethnol. Ethnology, ethnological.
et seq., *sq.*, or *sqq.* (Lat. *et sequentes*, or *et sequentia*). And the following.
Etym. or *Etymol.*, Etymology.
Ex. Example; Examined; Exception; Exodus.
Exc. Excellency; Except, excepted
Exch. Exchange; Exchequer.
Ex. Doc. Executive Document.
Exec. Executor.
Execx. Executrix.
Exod. Exodus.
Exon. (Lat. *Exonia*). Exeter.
Exr. Executor.
Exx. Executrix.
Ez. Ezra.
Ezek. Ezekiel.
E. & O. E. Errors and omissions excepted.
F. Fellow: Folio: Fahrenheit.
f. Farthing, farthings.
f., *fem.* Feminine.
f. Franc, francs.
Fahr. Fahrenheit.
F. A. S. Fellow of the Society of Arts.
F. C. Free Church of Scotland.
Fcp. Foolscap.
F. C. S. Fellow of the Chemical Society.
F. D., *Fid. Def.* (Lat. *Fidei Defensor*). Defender of the Faith.
Feb. February.
Fec. (Lat. *fecit*). He (*or* She) did it.
Fem. Feminine.
F. E. S. Fellow of the Entomological (*or* Ethnological) Society.
Feud. Feudal.
F. F. V. First Families of Virginia. (*Humorous*).
F. G. S. Fellow of the Geological Society.
fi. fa., *Fieri facias.* (Lat.). A form of judicial writ.
Fig. Figure, figures; figurative, figuratively.
Fl. Flemish; Florin, florins; Flourished.
Fla. Florida.
Flem. Flemish.
F. L. S. Fellow of the Linnæan Society.

ABBREVIATIONS, CONTRACTIONS AND DEGREES—Continued

F. M. Field Marshal.
Fo., Fol. Folio.
F. O. Foreign Office; Field Officer.
F. O. B. Free on board.
For. Foreign.
Fort. Fortification.
F. P. Fire-plug.
Fr. France, French; Francis; Francs.
fr. From.
F. R. C. S. Fellow of the Royal College of Surgeons.
Fred. Frederick.
F. R. G. S. Fellow of the Royal Geographical Society.
Fri. Friday.
F. R. S. Fellow of the Royal Society.
F. S. A. Fellow of the Society of Arts, *or* of Antiquaries.
Ft. Fort; Foot, feet.
Fth. Fathom.
Fur. Furlong.
F. Z. S. Fellow of the Zoölogical Society.
F. & A. M. Free and Accepted Masons.
G. Genitive; Guinea, guineas; Gulf.
Ga. Georgia.
Gael. Gaelic; Gadhelic.
Gal. Galatians.
gal. Gallon, gallons.
G. A. R. Grand Army of the Republic.
G. C. B. Grand Cross of the Bath.
G. C. H. Grand Cross of Hanover.
G. C. L. H. Grand Cross of the Legion of Honor.
G. C. M. G. Grand Cross SS. Michael and George.
G. C. S. I. Grand Commander of the Star of India.
G. D. Grand Duke, Grand Duchess.
Gen. General.
Gen. Genesis; Genitive.
Gend. Gender.
Genit. Genitive.
Gent. Gentleman, gentlemen.
Geo. George; Georgia.
Geog. Geography, geographical.
Geol. Geology, geological.
Geom. Geometry, geometrical.
Ger., Germ. German.
Gi. Gill, gills.
G. L. Grand Lodge.
G. M. Grand Master.
Go., Goth. Gothic.
G. O. P. Grand Old Party.
Gov. Governor.
Gov.-Gen. Governor-General.
Govt. Government.
G. P.-O. General Post-Office.
gr. Grain, grains; Gross.
Gr. Great; Greek.
Gram. Grammar, grammatical.
gro. Gross.
G. T. Good Templars; Grand Tyler.
gtt. (Lat. *gutta* or *guttæ*). Drop *or* drops.
H. Hour, hours.
H. B. M. His (*or* Her) Britannic Majesty.
H. C. Heralds' College; House of Commons.
H. C. M. His (*or* Her) Catholic Majesty.
h. e. (Lat. *hoc est, hic est*). That (*or* this) is.
Heb., Hebr. Hebrew, Hebrews.
Her. Heraldry, heraldic.
Hf.-bd. Half-bound.
H. H. His (or Her) Highness; His Holiness (the pope).
Hhd. Hogshead, hogsheads.
H. I. H. His (or Her) Imperial highness.
Hind. Hindu, Hindustan, Hindustani.
Hist. History, historical.
H. J., H. J. S. (Lat. *hic jacet, hic jacet sepultus*). Here lies, Here lies buried.
H. M. His (*or* Her) Majesty.
H. M. S. His (*or* Her) Majesty's Service, Ship, *or* Steamer.
Hon., Honble. Honorable.
Hor., Horol. Horology, horological.
Hort., Hortic. Horticulture, horticultural.
H. P. Half-pay; High Priest; Horse power.
H. R. House of Representatives.
H. R. E. Holy Roman Empire, *or* Emperor.
H. R. H. His (*or* Her) Royal Highness.
Hun., Hung. Hungary, Hungarian.
Hund. Hundred, hundreds.
Hydraul. Hydraulics.
Hydros. (See *Hyd.*)
Hypoth. Hypothesis, hypothetical.
I. Island.
Ia. Iowa.
Ib., Ibid. (Lat. *ibidem*). In the same place.
Icel. Iceland, Icelandic.
Ich., Ichth. Ichtyhology.
Id. (Lat. *idem*). The same.
Ida. Idaho.
i. e. (Lat. *id est*). That is.
I. H. S. (Lat. *Iesus* [or *Jesus*] *Hominum Salvator*). Jesus the Savior of Men.
Ill. Illinois.
Imp. (Lat. *imperator*). Emperor; Imperial; impersonal.
Imp., Imperf. Imperfect.
in. Inch, inches.
Incog. (Ital. *incognito, incognita*). Unknown.
Ind. India, Indian; Indiana.
Indic. Indicative.
Ind. Ter. Indian Territory.
Inf., Infin. Infinitive.
In loc. (Lat. *in loco*). In its place.
I. N. R. I. (Lat. *Iesus* [or *Jesus*] *Nazarenus Rex Iudæorum* [or *Judæorum*]). Jesus of Nazareth, King of the Jews.
Ins., Insur. Insurance.
Ins.-Gen. Inspector-General.
Inst. Instant; the present month; Institute, Institution.
Int. Interest.
Int. Dept. Department of the Interior.
Interj. Interjection.
Intrans. Intransitive.
In trans. (Lat. *in transitu*). On the passage.
Int. Rev. Internal Revenue.
Introd. Introduction.
Io. Iowa.
I. O. F. Independent Order of Foresters.
I. O. G. T. Independent Order of Good Templars.
I. O. O. F. Independent Order of Oddfellows.
I. O. R. M. Improved Order of Red Men.
I. O. S. M. Independent Order of Sons of Malta.
I. O. U. I owe you.
i. q. (Lat. *idem quod*). The same as.
Ir. Ireland, Irish.
Irreg. Irregular.
Is., Isa. Isaiah.
I. S. Irish Society.
Isl. Island.
I. S. M. Jesus Salvator Mundi.
It., Ital. Italy; Italic; Italian.
Itin. Itinerary.
J. Judge; Justice.
J. A. Judge-Advocate.
Jac. Jacob, Jacobus (= James).
Jan. January.
J. A. G. Judge Advocate General.
J. C. Jesus Christ.
J. C. D. (Lat. *juris civilis doctor*). Doctor of Civil Law.
J. D. (Lat. *jurum doctor*), Doctor of Laws.
Jer. Jeremiah.
J. H. S. [*I. H. S.*]
Jno. John.
Jon., Jona. Jonathan.
Jos. Joseph.
Josh. Joshua.
Jour. Journal.
J. P. Justice of the Peace.
Jr. Juror; Junior.
J. U. D. (Lat. *Juris utriusque doctor*). Doctor of both laws (*i. e.*, of civil and canon law).
Jud. Judith.
Judg. Judges.
Jul. July; Julius; Julian.
Jun. June.
Jun., Junr. Junior.
Juris. Jurisprudence.
K. King; Knight.
Kan., Ks. Kansas.
K. B. Knight of the Bath.
K. B. King's Bench.
K. C. King's Counsel; Knights of Columbus.
K. C. B. Knight Commander of the Bath.
K. C. H. Knight Commander of the Guelphs of Hanover.
K. C. M. G. Knight Commander of St. Michael and St. George.
K. E. Knight of the Eagle.
Ken., Ky. Kentucky.
K. G. Knight of the Garter.
K. G. E. Knight of the Golden Eagle.
K. G. C. Knight of the Grand Cross.
K. G. C. B. Knight of the Grand Cross of the Bath.
K. G. F. Knight of the Golden Fleece.
K. G. H. Knight of the Guelphs of Hanover.
Kilog. Kilogramme.
Kilom., Kilo. Kilometre.
Kingd. Kingdom.
K. L. H. Knight of the Legion of Honor.
K. M. Knight of Malta.
Kn. N. S. Knight of the Loyal Northern Star (Sweden).
Knick. Knickerbocker.
Knt. Knight.
K. of P. Knights of Pythias.
Ks. Kansas.
K. S. Knight of the Sword (Sweden).

ABBREVIATIONS, CONTRACTIONS AND DEGREES—Continued

Kt. Knight.
K. T. Knight of the Thistle; Knight Templar.
K. T. S. Knight of Tower and Sword (Portugal).
Ky. Kentucky.
L. Latin; Lake; Lord; Lady.
L., l., £. (Lat. *libra*). Pound, pounds (sterling).
L., lb., ℔. (Lat. *libra*). Pound, pounds (weight).
La. Louisiana.
L. A. Law Agent; Literate in Arts.
Lam. Lamentations.
Lat. Latin; Latitude.
lb. Pound, pounds (weight).
L. c. Lower case (in printing).
L. c., loc. cit. (Lat. *loco citato*). The place cited.
L. C. Lord Chamberlain; Lord Chancellor.
L. C. J. Lord Chief-Justice.
Ldp. Lordship.
Leg., Legis. Legislature, legislative.
Leip. Leipsic.
Lev. Leviticus.
Lex. Lexicon.
Lexicog. Lexicography, lexicographer, lexicographical.
L. G. Life Guards.
L. Ger. Low German or Platt Deutsch.
L. H. D. Doctor of Humanities.
L. I. Light Infantry; Long Island.
Lib. (Lat. *liber*). Book.
Lib. Library, librarian.
Lieut., Lt. Lieutenant.
Lieut.-col. Lieutenant-colonel.
Lieut.-gen. Lieutenant-general.
Lieut.-gov. Lieutenant-governor.
lin. Lineal, or right-line measures; *e. g.*, lin. yd.; lin. ft., etc.
Linn. Linnæus, Linné, Linnæan.
Liq. Liquor, liquid.
Lit. Literally, literature, library.
Lit. D., Litt. D. (Lat. *literarum doctor*). Doctor of Literature.
Lith. Lithography.
Liv. Livre.
LL. B. (Lat. *legum baccalaureus*). Bachelor of Laws.
LL. D. (Lat. *legum doctor*). Doctor of Laws.
LL. M. Master of Laws.
L. M. Long metre.
Lon., Lond. London.
Lon., Long. Longitude.
Loq. (Lat. *loquitur*). He (*or* she) speaks.
Lou. Louisiana.
L. S. (Lat. *locus sigilli*). Place of the seal.
L. s. d. (Lat. *libræ, solidi, denarii*). Pounds, shillings, pence.
Lt. Lieutenant.
Lt. Inf. Light Infantry.
Luth. Lutheran.
m. Married; Masculine; Mètre, mètres; Mile, miles; Minute, minutes.
M. Marquis; Middle; Monday; Morning; Monsieur.
M. (Lat. *mille*). Thousand.
M. (Lat. *meridies*). Meridian, Noon.
M. A. (Master of Arts). [*A. M.*]
Mac., Macc. Maccabees.
Mad., Madm. Madam.
Mag. Magyar; Magazine.
Maj. Major.
Maj.-gen. Major-general.
Mal. Malachi; Malay, Malayan.
Manuf. Manufactures, manufacturing.
Mar. March; Maritime.
Marq. Marquis.
Mass. Massachusetts.
Math. Mathematics, mathematician, mathematical.
Matt. Matthew.
M. B. (Lat. *medicinæ baccalaureus*). Bachelor of Medicine.
M. B. (Lat. *musicæ baccalaureus*). Bachelor of Music.
M. C. Member of Congress; Master of Ceremonies.
Mch. March.
M. C. (Lat. *medicinæ doctor*). Doctor of Medicine.
Md. Maryland.
Mdlle. (Fr. *mademoiselle*). Miss.
Mdse. Merchandise.
M. E. Most Excellent; Military Engineer; Mining Engineer; Mechanical Engineer.
M. E. Methodist Episcopal.
Me. Maine.
Meas. Measure.
Mech. Mechanics, mechanical.
Med. Medicine, medical; Mediæval.
Mem. Memorandum, memoranda.
Messrs. (Fr. *messieurs*). Gentlemen.
Metall. Metallurgy.
Metaph. Metaphysics; Metaphorically.
Meteor. Meteorology, meteorological.
Meth. Methodist.
Mex. Mexico.
Mfd., Mfs. Manufactured, manufactures.
Mfg. Manufacturing.
M. H. Ger. Middle High German.
M. I. C. E. Member of the Institute of Civil Engineers.
Mich. Michaelmas; Michigan.
Mid. Middle; Midshipman.
Mil., Milit. Military.
M. I. M. E. Member of the Institute of Mining Engineers.
Min. Mineralogy, mineralogical; Minute, minutes.
Minn. Minnesota.
Min. Plen. Minister Plenipotentiary.
Miss. Mississippi.
Mlle. (Fr. *mademoiselle*). Miss.
MM. Their Majesties.
MM. (Fr. *messieurs*). Gentlemen.
mm. Millemetres; Micrometers.
Mme. (Fr. *madame*). Madame.
M. N. A. S. Member of the National Academy of Sciences.
Mo. Missouri; Month.
Mod. Modern.
Mod. (Ital. *moderato*). Moderately.
Mon. Monday.
Mons. (Fr. *monsieur*). Sir, Mr.
Mont. Montana.
M. P. Member of Parliament.
M. P. P. Member of Provincial Parliament.
M. P. S. Member of the Pharmaceutical Society; Member of the Philological Society.
Mr. Master, Mister.
M. R. A. S. Member of the Royal Asiatic Society.
M. R. C. P. Member of the Royal College of Physicians.
M. R. C. S. Member of the Royal College of Surgeons.
M. R. G. S. Member of the Royal Geographical Society.
M. R. I. Member of the Royal Institution.
Mrs. Mistress (when abbreviated pronounced mis'sis).
M. S. Master of Surgery.
M. S. Master of Science.
M. S. (Lat. *Memoriæ sacrum*). Sacred to the memory of.
MS. Manuscript.
MSS. Manuscripts.
Mt., Mts. Mount, mountains.
Mus. Museum; Music, musical.
Mus. B. (Lat. *Musicæ Baccalaureus*). Bachelor of Music.
Mus. D., Mus. Doc., Mus. Doct. (Lat. *Musicæ Doctor*). Doctor of Music.
Myth. Mythology, mythological.
N. Noon; North; Noun; Number; New; Neuter.
N. A. North America, North American.
Nap. Napoleon.
Nat. Natural; National; Natal.
Nat. Hist. Natural History.
Nat. Phil. Natural Philosophy.
Naut. Nautical.
N. B. New Brunswick; North Britain (*i. e.* Scotland).
N. B. (Lat. *Nota bene*). Note well, Take notice.
N. C. North Carolina.
N. D., N. Dak. North Dakota.
N. E. New England; Northeast.
Neb. Nebraska.
Neg. Negative, negatively.
Neth. Netherlands.
Neut. Neuter.
Nev. Nevada.
New Test., N. T. New Testament.
N. F. Newfoundland.
N. H. New Hampshire.
N. J. New Jersey.
N. Lat. North Latitude.
N. M. New Mexico.
N. N. E. North-northeast.
N. N. W. North-northwest.
No. (Lat. *numero*). Number.
nol. pros. (*nolle prosequi*). To be unwilling to proceed.
Nom. Nominative.
Non con. Non-content, dissentient. (The formula in which Members of the House of Lords vote.)
Non obst. (Lat. *non obstante*). Notwithstanding.
Non pros. (Lat. *non prosequitur*). He does not prosecute.
Non seq. (Lat. *non sequitur*). It does not follow (as a consequence).
n. o. p. Not otherwise provided for.
Nor., Norm. Norman.
Nor. Fr., Norm. Fr. Norman French.
Norw. Norway, Norwegian, Norse.
Nos. Numbers.
Nov. November.
N. P. Notary Public.
N. S. New style (since 1752); Nova Scotia.
N. T. New Testament.
Num., Numb. Numbers.
N. V. M. Nativity of the Virgin Mary.
N. W. Northwest.

ABBREVIATIONS, CONTRACTIONS AND DEGREES—Continued

N. W. T. Northwest Territory.
N. Y. New York.
N. Z. New Zealand.
O. Ohio; Old.
ob. (Lat. *obiit.*) He (*or* she) died.
Ob., *Obad.* Obadiah.
Obdt., *Obt.* Obedient.
Obj. Objective.
Obs. Obsolete.
Oct. October.
Oct., *8vo.* Octavo.
O. H. Ger. Old High German.
O. K. "All correct."
Okl. Oklahoma.
Old Test., *O. T.* Old Testament.
Olym. Olympiad.
Op. Opposite, opposition.
Opt. Optative; Optics, optical.
Ordn. Ordnance.
Ore. Oregon.
Orig. Original, originally.
Ornith. Ornithology, ornithological.
O. S. Old Style (previous to 1752); Old Saxon.
O. S. A. Order of St. Augustine.
O. S. B. Order of St. Benedict.
O. S. F. Order of St. Francis.
O. T. Old Testament.
O. U. A. M. Order of United American Mechanics.
Oxf. Oxford.
Oxon. (Lat. *Oxonia*, *Oxoniensis*). Oxford; of Oxford.
Oxonien. (Lat. *Oxoniensis*). Of Oxford.
oz. Ounce. [The *z* in this contraction and in *viz.*, represents an old symbol (ʒ), used to mark a terminal contraction.]
P. Page; Participle; Past; Pole; Port.
Pa. Pennsylvania.
P. a., *par. a.* Participial adjective.
Paint. Painting.
Pal., *Palæont.* Palæontology, palæontological.
Par. Paragraph.
Parl. Parliament, parliamentary.
Part. Participle.
Pass. Passive.
Pat. Patrick.
Payt. Payment.
P. C. (Lat. *Patres Conscripti*). Conscript Fathers.
P. C. Police Constable; Privy Council, Privy Councilor.
Pd. Paid.
P. E. Protestant Episcopal.
P. E. I. Prince Edward Island.
Penn. Pennsylvania.
Pent. Pentecost.
Per., *Pers.* Persia; Persian; Personal.
Per. an. (Lat. *per annum*). Yearly.
Per cent., *per ct.* (Lat. *per centum*). By the hundred.
Perf. Perfect.
Persp. Perspective.
Peruv. Peruvian.
Pet. Peter.
P. G. M. Past Grand Master.
Phar., *Pharm.* Pharmacy.
Ph. B. (Lat. *Philosophiæ Baccalaureus*). Bachelor of Philosophy.
Ph. D. (Lat. *Philosophiæ Doctor*). Doctor of Philosophy.
Phil., *Phila.* Philadelphia.
Phil. Philip; Philippians; Philosophy, philosophical.
Philol. Philology.
Philos. Philosophy, philosophical.
Ph. M. Master of Philosophy.
Photog. Photography, photographic, photographer.
Phren., *phrenol.* Phrenology, phrenological.
Phys. Physics, physical, physiology, physiological.
Physiol. Physiology, physiological.
Pinx., *Pxt.* (Lat. *pinxit*). He (*or* she) painted it.
Pk. Peck.
Pl. Place; Plate; Plural.
P. L. Poet Laureate.
Plff., *Pltff.* Plaintiff.
Plu. Plural.
Plup., *Plupf.* Pluperfect.
Plur. Plural.
P. M. (Lat. *post meridiem*). Afternoon.
P. M. Past Master; Peculiar Meter; Postmaster.
P. M. G. Postmaster-General.
P. O. Post-office.
P. & O. Co. Peninsular and Oriental Steam Navigation Company.
Pol. Polish.
Polit. Econ. Political Economy.
P. O. O. Post-office order.
Pop. Population.
Port. Portugal, Portuguese.
Poss. Possessive.
pp. Pages.
p. p. Past (*or* perfect) participle.
P. P. (Lat. *pater patriæ*). Father of his country.
P. C. C. (Fr. *pour prendre congé*). To take leave. [*T. T. L.*]
Pph. Pamphlet.
p. pr. Present participle.
Pr. Present; Priest; Prince.
P. R. (Lat. *populus Romanus*). The Roman people.
P. R. C. (Lat. *Post Roman conditam*). After the building of Rome. [*A. U. C.*]
Pref. Prefix; Preface.
prep. Preposition.
Pres. President; Present.
Prim. Primary.
Prin. Principal; Principles.
Print. Printing.
Prob. Problem; Probable, probably.
Prof. Professor.
Pron. Pronoun; Pronounced, pronunciation.
Prop. Proposition; Properly.
Pros. Prosody.
Pro tem. (Lat. *pro tempore*). For the time being.
Prov. Proverbs, proverbial, proverbially; Provincial, provincially; Provost.
Provinc. Provincial.
Prox. (Lat. *proximo*). Next of or of the next month.
Prs. Pairs.
Prus. Prussia, Prussian.
P. S. (Lat. *post scriptum*). Postscript.
P. S. Privy Seal.
Ps., *Psa.* Psalm, psalms.
Psychol. Psychology.
Pt. Part; Payment; Point; Port.
P. T. Post-town; Pupil teacher.
Pub. Public; Published, publisher.
Pub. Doc. Public Documents.
Pwt. Pennyweight.
Pxt. [PINX.]
Q., *Qu.* Query; Question.
Q. d. (Lat. *quasi dicat*). As if he should say.
Q. e. (Lat. *quod est*). Which is.
Q. E. D. (Lat. *quod erat demonstrandum*). Which was to be proved.
Q. E. F. (Lat. *quod erat faciendum*). Which was to be done.
Q. E. I. (Lat. *quod erat inveniendum*). Which was to be found out.
Q. l. (Lat. *quantum libel*). As much as you please.
Q. M. Quartermaster.
Q. M. Gen. Quartermaster-General.
Qr. Quarterly; Quire.
Q. S. Quarter Sessions.
Q. s. (Lat. *quantum sufficit*). A sufficient quantity.
Qt. Quart.
Qu. Queen; Query; Question.
Quar., *quart.* Quarterly.
Quar., *4to.* Quarto.
Ques. Question.
Q. v. (Lat. *quod vide*). Which see.
Qy. Query.
R. Railway; Réaumur; River.
R. (Lat. *rex*). King; (Lat. *regina.*) Queen.
R. (Lat. *recipe*). Take.
R. A. Royal Academy, Royal Academician; Rear-Admiral; Royal Arch; Royal Artillery.
Rad. (Lat. *radix*). Root.
R. C. Roman Catholic.
R. E. Reformed Episcopal.
Réaum. Réamur.
Rec. Recipe.
Recd. Received.
Recpt. Receipt.
Ref. Reference.
Ref. Ch. Reformed Church.
Ref. Pres. Reformed Presbyterian.
Reg. Regular.
Reg., *Regr.* Registrar.
Reg., *Regt.* Regiment, regimental.
Rel. Pron. Relative Pronoun
Rem. Remark, remarks.
Rep. Report; Representative.
Rep. Repub. Republic; Republican.
Res. Resolution.
Retd. Returned.
Rev. Revelation; Revenues; Reverend; Reviews; Revise.
Revd. Reverend.
Revs. Reverends.
Rev. Stat. Revised Statutes.
R. F. D. Rural Free Delivery.
Rhet. Rhetoric, rhetorical.
R. I. Rhode Island.
Riv. River.
R. M. S. Royal Mail Steamer; Royal Mail Service.
R. N. Royal Navy.
Robt. Robert.
Rom. Roman, Romans.
Rom. Cath. Roman Catholic.
R. P. Regius Professor.
R. R. Railroad.
R. S. V. P. (Fr. *Répondez s'il vous plaît*). Please reply.
Rt. Right.
Rt. Hon. Right Honorable.
Rt. Rev. Right Reverend.
R. T. S. Religious Tract Society
Rt. Wpful. Right Worshipful.
Russ. Russia, Russian.
R. V. Revised Version; Rifle Volunteers.
Ry. Railway.

ABBREVIATIONS, CONTRACTIONS AND DEGREES—Continued

S. Saint; Saturday; Section; Shilling; Sign; Signor; Solo; Soprano; South; Sun; Sunday; Sabbath.
s. Second, seconds; See; Singular; Son; Succeeded.
S. A. South Africa; South America.
S. A. (Lat. *secundem artem*). According to the rules of art.
Sab. Sabbath.
Sam., *Saml.*, Samuel.
Sam., *Samar.* Samaritan.
Sans., *Sansc.*, *Sansk.* Sanscrit, Sanskrit.
Sat. Saturday.
Sax. Saxon, Saxony.
S. C. South Carolina.
Sc. [SCIL. SCULL.]
S. caps., *Sm. caps.* Small capitals. (In printing.)
Sc. B. (Lat. *scientiæ baccalaureus*). Bachelor of Science.
Sc. D. (Lat. *scientiæ doctor*). Doctor of Science.
Sch. (Lat. *scholium*). A note.
Sci. Science.
Sci. fa. *Scire facias.*
Scil. Sc. (Lat. *scilicet*). Namely; to wit.
Sclav. Sclavonic.
Scot. Scotland, Scotch, Scottish.
Scr. Scruple, scruples.
Scrip., *Script*, Scripture, scriptural.
Sculp. Sculpture.
Sculp., *Sculpt.*, *Sc.* (Lat. *sculpsit*). He (*or* she) engraved it.
S. D. Doctor of Science.
S. D., *S. Dak.* South Dakota.
S. E. Southeast.
Sec. Second.
Sec., *Sect.* Section.
Sec., *Secy.* Secretary.
Sec. Leg. Secretary of Legation.
Sen. Senate, senator.
Sen. Doc. Senate Document.
Sep., *Sept.* September.
Seq. (Lat. *sequentes*, *sequentia*). The following or the next.
Serg., *Sergt.* Sergeant.
Serg. Maj. Sergeant-Major.
Serv. Servian.
Sess. Session.
S. G. Solicitor-general.
Sh. Shilling, shillings.
Sing. Singular.
S. J. Society of Jesus.
S. J. C. Supreme Judicial Court.
Skr. Sanskrit.
Slav. Slavonic.
Soc., *Socy.* Society.
Sol.-gen. Solicitor-general.
Sp. Spain, Spanish; Spirit.
s. p. (Lat. *sine prole*). Without issue.
S. P. C. A. Society for the Prevention of Cruelty to Animals.
S. P. C. C. Society for the Prevention of Cruelty to Children.
S. P. C. K. Society for the Promotion of Christian Knowledge.
Spec. Special, specially.
sp. gr., *s. g.* Specific gravity.
S. P. Q. R. (Lat. *Senatus Populusque Romanus*). The Senate and the People of Rome.
sq. Square; *sq. ft.* Square foot, feet; *sq. in.* Square inch, inches; *sq. m.* Square mile, miles; *sq. yd.* Square yard; *sq. rd.* Square rod.
Sr. Senior; sir.
S. R. I. (Lat. *Sacrum Romanum Imperium*). The Holy Roman Empire.
SS. Saints.
S. S. Sunday-school.
S. S. E. South-southeast.
S. S. W. South-southwest.
St. Saint; Stone; Strait; Street.
st. (Lat. *stet*). Let it stand (in printing).
Stat. Statute, statutes; Statuary.
S. T. B. Bachelor of Sacred Theology.
S. T. D. (Lat. *sacræ theologiæ doctor*). Doctor of Divinity.
ster., *stg.* Sterling.
Str. Steamer, steam vessel.
Subj. Subjunctive.
Suff. Suffix.
Sun., *Sund.* Sunday.
Sup. Superior; Superlative; Supplement; Supine.
Sup. Ct. Supreme Court.
Supt. Superintendent.
Sur., *Surg.* Surgeon, surgery.
Sur.-gen. Surgeon-general.
Surv. Surveying, surveyor.
Surv.-gen. Surveyor-general.
S. v. (Lat. *sub voce*). Under the word or title.
S. W. Senior Warden; Southwest.
Sw. Sweden, Swedish.
Switz. Switzerland.
Syn. Synonym, synonymous.
Synop. Synopsis.
Syr. Syria, Syriac; Syrup.
T. Tenor; Ton; Tun; Tuesday.
Tab. Table; Tabular statement.
Tan. Tangent.
Tech. Technical, technically.
Ten., *Tenn.* Tennessee.
Ter. Territory.
Term. Termination.
Teut. Teutonic.
Tex. Texas.
Th. Thomas; Thursday.
Theo. Theodore.
Theol. Theology.
Theor. Theorem.
Thess. Thessalonians.
Tho., *Thos.* Thomas.
Thu., *Thur.*, *Thurs.* Thursday.
Tier. Tierce.
Tit. Title; Titus.
Tom. Tome, volume.
Tonn. Tonnage.
Topog. Topography, topographical.
Tp. Township.
Tr. Translation, translator, translated; Transpose; Treasurer; Trustee.
Trans. Transaction; Translation, translator, translated.
Trav. Travels.
Treas. Treasurer.
Trig., *Trigon.* Trigonometry, trigonometrical.
Trin. Trinity.
Tu., *Tues.* Tuesday.
Turk. Turkey, Turkish.
Typ. Typographer.
Typog. Typography, typographical.
U. C. (Lat. *urbis conditæ*). From the building of the city—Rome. [A. U. C.]
U. K. United Kingdom.
Ult. (Lat. *ultimo*). Last, of the last month.
um. Unmarried.
Unit. Unitarian.
Univ. University.
Up. Upper.
U. P. United Presbyterian.
U. S. United States.
U. S. A. United States of America; United States Army.
U. S. L. United States Legation.
U. S. M. United States mail; United States marine.
U. S. M. A. United States Military Academy.
U. S. N. United States Navy.
U. S. N. A. United States Naval Academy.
U. S. S. United States Senate; United States ship or steamer.
U. S. S. Ct. United States Supreme Court.
Usu. Usual, usually.
V. Verb; Verse; Victoria; Violin.
V., *vs.* (Lat. *versus*). Against.
V. (Lat. *vide*). See.
V. A. Vicar Apostolic; Vice-admiral.
Va. Virginia.
Val. Valve; Value.
Var. Variety.
Vat. Vatican.
V. aux. Verb auxiliary.
V. C. Vice-chancellor; Victoria Cross.
Ven. Venerable.
V. G. Vicar-General.
V. g. (Lat. *verbi gratia*). For the sake of example.
V. i. Verb intransitive.
Vice-pres. Vice-president.
Vid. (Lat. *vide*). See.
V. imp. Verb impersonal.
V. irr. Verb irregular.
Vis., *Visc.* Viscount.
Viz. (Lat. *videlicet*). Namely; to wit. [Oz.]
V. n. Verb neuter.
Voc. Vocative.
Vol. Volume.
Vols. Volumes.
V. P. Vice-president.
V. Rev. Very Reverend.
Vs. (Lat. *versus*). Against.
V. S. Veterinary surgeon.
V. t. Verb transitive.
Vt. Vermont.
Vul., *Vulg.* Vulgate.
vv. ll. (Lat. *variæ lectiones*). Various readings.
W. Wednesday; Week; Welsh; West, western.
Walt. Walter.
Wash. Washington.
w. c. Water closet.
W. C. A. Women's Christian Association.
W. C. T. U. Women's Christian Temperance Union.
Wed. Wednesday.
Wel. Welsh.
w. f. Wrong font (in printing).
Whf. Wharf.
W. I. West Indies, West Indian.
Wis., *Wisc.* Wisconsin.
Wk. Week.
W. Long. West Longitude.
Wm. William.
W. N. W. West-northwest.
Wp. Worship.
Wpful. Worshipful.
W. S. W. West-southwest.
Wt. Weight.
W. Va. West Virginia.
Wyo. Wyoming.

ABBREVIATIONS, CONTRACTIONS AND DEGREES—Concluded

Xm., *Xmas.* Christmas.
Y. Year.
Yd. Yard.
Yds. Yards.
Ye. The; Thee.
Y. M. C. A. Young Men's Christian Association.
Y. M. Cath. A. Young Men's Catholic Association.
Y. M. H. A. Young Men's Hebrew Association.
Y. P. S. C. E. Young People's Society of Christian Endeavor.
Yr. Year; Younger; Your.
Ys. Years; Yours.
Y. W. C. A. Young Women's Christian Association.
Zach. Zachary.
Zech. Zechariah.
Z. G., *Zoo.* Zoölogical Gardens.
Zoöl. Zoölogy, zoölogical.

PUNCTUATION

Punctuation is the indication, by means of stops, of the different pauses necessary to show the meaning of a sentence.

Stops, therefore, are used to elucidate the meaning of words in their relation to other words.

The Period [.].—Declarative and imperative sentences, when not connected in construction with what follows, are closed by periods.

Examples:—The child is father of the man.
The king is dead, long live the king.

A period should be placed after every abbreviation. The period thus used is part of the abbreviation.

Examples:—*Wash.*, Washington; *Gen.*, General; *Pro tem.*, *pro tempore*, for the time being; *Esq.*, Esquire; *Gov.*, Governor.

Such expressions as 3d, 18th, 8mo, are not abbreviations and do not require a period after them.

A period should always be placed after the Roman numerals.

Examples:—I., II., III., IV., V., VI., VII., VIII., IX., X., etc.

Interrogation Point [?].—The interrogation point is used for marking all questions. When the question consists of several parts, or when several questions are contained in one sentence, there is some difficulty in deciding whether there should be one or more interrogation points. The principle is that if one answer is sufficient for all, one point is enough; if different answers are required, a point should be placed after each question.

Examples:—What can I do for you?
Now, you understand?

Exclamation Point [!].—The exclamation point is placed at the end of every sentence, clause, phrase, or word intended to convey strong emotion.

Examples:—Praise be thine, O God!
Lost! Lost! O that I were home!

Colon [:].—Two clauses, one or both of which are subdivided by the semicolon, should be separated from each other by the colon.

Example:—This chapter is divided into two sections: the first, which was written many years since, being a history of the institution; the second, a prophecy as to its future.

The colon is used before all direct quotations, if formally introduced, and after all words which formally introduce a sentence to follow. If the quoted matter begins a new paragraph, the colon should be followed by a dash.

Examples:—Cæsar spoke as follows: (His speech to follow.)
He replied in these words: "I shall always be prepared in future."
My dear Friend: (A letter following.)

The colon is sometimes used between complete sentences where the period would indicate too long a pause, and the semicolon too short a pause.

Examples:—It was a dark and dreary night: the wind was blowing in fitful gusts.
It is over: let us go.

Semicolon [;].—When two clauses are united by either of the conjunctions *for*, *but*, *and*, or an equivalent word—the one clause perfect in itself, and the other added as a matter of inference, contrast or explanation—they are separated by a semicolon.

Example:—Economy is no disgrace; for it is better to live on a little than to outlive a great deal.

A semicolon is placed between two or more parts of a sentence when these, or any of them, are divisible by a comma into smaller portions.

Example:—Men are not to be judged by their looks, habits, and appearances; they should be judged by the character of their lives and conversations, and by their works.

When in a series of expressions the particulars depend on a commencing or concluding portion of the sentence, they should be separated from each other by a semicolon if laid down as distinct propositions or of a compound nature.

Example:—Philosophers assert that Nature is unlimited in her operations; that she has inexhaustible treasures in reserve; that knowledge will always be progressive; and that all future generations will continue to make discoveries of which we have not the slightest idea.

When several short sentences follow one another, slightly connected in sense or in construction, they should be separated by a semicolon.

Example:—Stones grow; vegetables grow and live; animals grow, live, and feel.

A semicolon is put before *as*, *viz.*, *to-wit*, *namely*, *i. e.*, or *that is*, when they precede an example or a specification of particulars, or subjects enumerated; and also between these particulars when they consist each of a disjunct pair of words, or of a single word or phrase but slightly connected with the others.

Example:—Many words are differently spelled in English; as, "Inquire, enquire; jail, gaol; skeptic, sceptic."

Comma [,].—Two words belonging to the same part of speech, or used as such, when closely connected by one of the conjunctions *and*, *or*, *nor*, are not separated by a comma from each other.

Example:—Pay supreme and undivided homage to goodness and truth.

Two words of the same part of speech and in the same construction, if used without a conjunction between them, are separated from each other by a comma.

Example:—We are fearfully, wonderfully made.

Two nouns or pronouns in apposition, or a noun and a pronoun, should not be separated by a comma if they may be regarded as a proper name or as a single phrase.

Example:—The poet Milton wrote excellent prose and better poetry.

But a noun or pronoun and a phrase, or two or more phrases, if put in apposition so that they may not be so regarded, are separated by a comma from each other, and from what follows in the same sentence.

Example:—Homer, the greatest poet of antiquity, is said to have been blind.

Words or phrases contrasted with each other, or having a mutual relation to others that follow them in the same clause, are separated by commas.

Example:—False delicacy is affectation, not politeness.

A comma is put before a relative clause when it is explanatory of the antecedent or presents an additional thought.

Example:—Behold the emblem of thy state in flowers, which bloom and die.

But the point is omitted before a relative that restricts the general notion of the antecedent to a particular sense.

Example:—Every teacher must love a boy who is attentive and docile.

Expressions of a parenthetical or intermediate nature are separated from the context by commas.

Example:—The sun, with all its attendant planets, is but a very little part of the grand machine of the universe.

A word or an expression used independently in addressing a person or an object is separated by a comma from the rest of the sentence.

Example:—Antonio, light my lamp within my chamber.

Adjectival, participial, and absolute phrases are each separated by a comma from the remainder of the sentence.

Awkward in his person, James was ill qualified to command respect.

Adverbs or adverbial phrases, when used as connectives, or when they modify not single words, but clauses or sentences, are each followed by a comma; and if used intermediately they admit a comma before as well as after them.

Example:—The most vigorous thinkers and writers are, in fact, self-taught.

When a phrase beginning with a preposition, an adverb, or a conjunction relates to or modifies a preceding portion of the sentence, a comma is unnecessary if the parts are closely connected in sense.

Example:—For that agency he applied without a recommendation.

Many phrases which, in their natural or usual order, do not require to be punctuated, are, when placed in some other or unnatural position, set off by a comma from the rest of the sentence.

Example:—By Cowley, the philosopher Hobbes is compared to Columbus.

When one of two clauses depends on the other, they are separated by a comma.

Example:—If you would be revenged on your enemies, let your life be blameless.

Two correlative expressions united by the conjunction *as* or *than* are written without a point between them.

Example:—Men are never so easily deceived as when they plot to deceive others.

But when united by any other word than one of these conjunctions, the correlative expressions are separated by a comma.

Example:—Though learned and methodical, yet the teacher was not a pedant.

Words or phrases in the same construction, forming a series, are separated from each other by commas.

Example:—Scrooge was his sole executor, his sole administrator, his sole assign, his sole residuary legatee, his sole friend, and sole mourner.—*Dickens.*

But when the members of the series are closely connected in sense, the commas should be omitted.

Example:—Government of the people by the people for the people.

When in a compound sentence the clauses have each a different nominative, but have only one verb, expressed in the first clause and understood in the others, the ellipsis, or place of the verb, should be supplied by a comma.

Example:—A wise man seeks to shine in himself, a fool to outshine others.

A short quotation, or any expression that resembles a quotation, is separated by a comma from an introductory clause.

Example:—Dr. Thomas Brown truly says, "The benevolent spirit is as universal in its efforts as the miseries which are capable of being relieved."

Dash [—].—The dash denotes an abrupt break in a sentence.

Example:—Here lies the great—false marble, where?
Nothing but sordid dust lies here.

The dash is used to indicate that something is left unfinished.

Example:—We cannot hope to succeed unless—
But we must succeed.

The dash is sometimes used instead of brackets before and after a parenthesis.

Example:—The man actually—this is in the strictest confidence—filled his pocket with my cigars when he thought I was not looking.

The dash is used instead of the colon where the word "namely" is implied but not expressed.

Example:—The sentence should be amended to read "—whenever and wherever the president shall determine."

Parentheses [()].—Parentheses are used to inclose an explanation, authority, definition, reference, translation, or any matter not belonging to the grammatical construction of the sentence.

Example:—He gained from heaven ('twas all he wished) a friend.

Brackets ([]).—The use of brackets is about the same as that of the marks of parenthesis, but is generally confined to words inserted in quotations for the sake of explanation.

Example:—Dickens has given a very lively account of this place [the Academy] in his paper entitled "Our School," but it is very mythical in many respects.

Quotation Marks [" "].—Quotation marks are used before and after a passage quoted in the exact words of another.

Example:—"My very dog," sighed poor Rip, "has forgotten me."

Matter quoted indirectly, or given only in substance, is not placed within quotation marks.

A quotation within a quotation is inclosed in single marks.

Example:—"His staff and knapsack, her little bonnet and basket, etc., lie beside him. 'She'll come to-morrow,' he says, when it gets dark, and goes sorrowfully home."

Where a quotation consists of several paragraphs, quotation marks should be used at the beginning of each paragraph, but at the close of the last paragraph only.

Titles of books, essays, newspapers, etc., should be placed within quotation marks, unless in italics or capitals.

Hyphen [-].—The hyphen is used between the parts of certain compound words, and to mark the division of syllables in showing the spelling of words. It is sometimes used in place of the diæresis after a prefix ending in a vowel before a word beginning with a vowel.

Example:—Horse-chestnut, Franco-Prussian, re-edit, de-vi-ate, truth-telling, text-book.

Compound Words.—Rule I.—Compounds made by omitting particles, and used literally, are generally written with a hyphen.

Many such words that coalesce in pronunciation, and have become very familiar, are written continuously.

after-events	broomstick
almond-oil	eyeball
arrow-head	milkman
battle-ax	outlook

Rule II.—Two or more normally separate words are joined with hyphens if used in an adjective sense before a noun.

A sight never to be forgotten.
A never-to-be-forgotten sight.

Rule III.—A full phrase used as the name of something not literally indicated by the phrase is written with a hyphen or hyphens.

Those here given are names of plants:

Aaron's-beard	forget-me-not

Rule IV.—Compound words showing arbitrary application of the literal idea expressed by their separated elements take no hyphen.

blackberry	pronghorn (antelope)
bluefish	marrowfat (a pea)
everybody	arrowhead (a plant)
however	matchlock (a gun)

cottonwood (a tree)

(Care should be taken not to apply this rule in cases where it does not really fit. Thus, *any one, one's self*, etc., are often wrongly printed as *anyone, oneself*, etc.)

Apostrophe ['].—The apostrophe is used in the possessive case of nouns, to denote the plural of figures and letters, and to mark the elision of letters at the beginning or middle of a word, and the omission of figures in a number or date.

Example:—John's, men's, 2's, 7's, p's and q's, I've, I'll, don't, won't, Po'keepsie, tho', '92, '76.

MISCELLANEOUS MARKS

Ellipsis [* * * *] signifies a leaving out, defect, omission.

Leaders [...] serve to carry the eye across the pages of indexes, tables, contents, etc.; thus:

Needle-gun invented.....1856

Brace [{].—It is the vertical curved line used to signify that two or more words or lines are to be taken together—thus:

Americans { Aboriginal / Native / Emigrants

Asterisk [*].—It is used in printing or writing as a reference to a passage or note in the margin or at the bottom of a page, and also to supply the omission of letters or words.

Dagger, or Obelisk [†] is so called from its resemblance to a dagger, or inverted obelisk. It is also a mark of reference to a note in the margin or at the bottom of the page.

Double Dagger [‡] is the third reference mark used when there are more than two used on a page.

Parallels [||].—This character is used in writing and printing to call attention to a similarly marked note in the margin or at the foot of the page.

Section Mark [§] is the character often used to denote a division of a writing or subdivision of a chapter; a paragraph.

Paragraph [¶] is the sign which notes the division of a writing into distinct parts, sections or subdivisions.

Index, or Pointer [☞] is used to direct particular attention to a note or paragraph. It is sometimes called a *fist*.

Asterism [⁂ or ⁂], or cluster of stars, is used as a sign to direct attention to a passage, or paragraph, especially when such attention is deemed very important.

RHETORICAL FIGURES OF SPEECH

Figures of speech, or tropes, are used to make language more effective by adding special strength and beauty. They are words used in meanings not their own designed to secure a peculiarly happy effect. Thus when the poet writes:

"But yonder comes the powerful king of day,
Rejoicing in the East....."

he uses "king of day" for "sun"; and no one can fail to notice the pleasureable effect produced.

Chief Rhetorical Figures of Speech

Resemblance.	*Contiguity.*	*Contrast or Surprise.*
a. Comparison or Simile.	*a.* Autonomasia—Individual for class.	*a.* Antithesis and Epigram.
b. Metaphor—		*b.* Hyperbole.
1. Identification of like qualities.	*b.* Synecdoche—Part for whole.	*c.* Irony and Euphemism.
2. Identification of like things.	*c.* Metonymy—Cause for effect, badge for class, etc.	*Arrangement.*
c. Personification.		*a.* Climax.
d. Allegory.		*b.* Anti-climax.
		c. Emphasis, or Inversion.

But the new word images introduced must really be suited to add strength or beauty. Notice the contrast between these two descriptions of morning:

The saffron morn, with early blushes spread,
Now rose refulgent from Tithonus' bed,
With new-born day to gladden mortal sight,
And gild the courts of heaven with sacred light.
—*Pope's Homer.*

The sun had long since in the lap
Of Thetis taken out his nap;
And, like a lobster boiled, the morn
From black to red began to turn.
—*Butler's Hudibras.*

Principal Figures—The common figures are metaphor, simile, allegory, personification, apostrophe, euphemism, hyperbole, antithesis, epigram, irony, climax, onomatopœia (*ŏm-ŏn-a-tō-pœ'-ĭ-a*), and alliteration.

Simile.—A simile is a comparison between objects that are not of the same class, and usually expressed by either *like* or *as*.

Examples:—The warrior fought like a lion.
His spear was like the mast of a ship.
His wrath was as the storm.

Metaphor.—A metaphor is a comparison which is implied between two objects that are not of the same class. Unlike the simile, it does not state the resemblance, it takes that for granted and proceeds as if the two things were one—we no longer say, "He fought *like* a lion," but, "He *was* a lion in the fight."

Allegory.—Under which head fall Fables and Parables, is an extended Metaphor generally accompanied by Personification.

Example:—Bunyan's *Pilgrim's Progress;* Spenser's *Faerie Queene.*

Personification.—Attributes life to inanimate objects. It speaks of "The *childhood* of a nation," of "a *learned* age" of "the *thirsty* ground," of "*eager* darts," of "*winged* words."

Apostrophe.—Is a Personification accompanied by an address, or an address to an absent person.

Example:—
Ye hills and dales, ye rivers, woods, and plains,
And ye that live and move, fair creatures, tell.

Hyperbole is effective exaggeration.

Example:—
Her eye in heaven
Would through the airy region stream so bright,
That birds would sing and think it were not night.

Antithesis is a contrast of words or thoughts.

Examples:—

Better be first, he said, in a little Iberian village
Than be second in Rome.

Epigram is a short antithesis. It is often of the nature of a proverb.

Examples:—

Some are too foolish to commit follies.
The child is father of the man.

Irony is hidden satire.

Example:—

'Tis pretty, sure, and very probable,
That eyes, that are the frail'st and softest things,
Should be called tyrants, butchers, murderers.

Metonymy.—Metonymy is a figure of rhetoric in which the name of one object is put for another, the two being so related that the mention of one recalls the other.

Examples:—

He writes a good hand (handwriting).
Death fell in showers (bullets).
The kettle boils (water).
The pen is mightier than the sword (intelligence *vs.* force).

Synecdoche occurs where the part is taken for the whole, the species for the genus, the material for the thing made of it, where the person is designated by the most conspicuous trait of his character or the effect he produces.

Thus we may speak of "all hands being at work," of so many "head" of cattle.

Climax.—Climax, or the rhetorical ladder, is the arrangement of a succession of words, or clauses, in such a way that the weakest may stand first; and that each in turn may rise in importance and make a deeper impression on the mind than that which preceded it.

Anti-climax reverses the order: this is often used in humorous writings.

Examples:—I came, I saw, I conquered.

Since concord was lost, friendship was lost, fidelity was lost, liberty was lost—all was lost.

We have petitioned, we have remonstrated, we have supplicated, we have prostrated ourselves before the throne.—*Patrick Henry.*

Alliteration repeats the same sound in words for the purpose of adding to the euphony.

Examples:—

*S*ilently out of the room there *g*lided the *g*listening *s*avage,
Bearing the *s*erpent's *s*kin and *s*eeming himself like a *s*erpent,
*W*inding his *s*inuous *w*ay in the *d*ark to the *d*epths of the forest.

***Onomatopœia** emphasizes the meaning by adapting the sound to the sense.

Example from *Cataract of Lodore:*—

And sounding and bounding and rounding,
And bubbling and troubling and doubling,
And grumbling and rumbling and tumbling,
And clattering and battering and shattering.

Euphemism is the form of expression by which bad or dangerous things are spoken of in gracious terms. As an example we say death is "parting" or "falling asleep."

*Name-making; the formation of words in imitation of the sounds made by the things signified: as, buzz, hiss, peewit, etc. It is held by some philologists that all language had its origin in onomatopœia, words formed by this principle being the most natural, and readily suggesting the actions or objects producing the sounds which the words are intended to represent.

Emphasis, or Inversion, adds greatly to the precision as well as vigor of style when temperately used. That is, when the *predicate* or *object* are much more impressive or mentally prominent than the *subject* they may with advantage precede it.

Any special emphasis may justify inversion. It is frequently used to indicate a swift or abrupt action—Commands frequently assume this form and owe to it half their force.

Examples:—

Great is Diana of the Ephesians,
Sweet is the breath of morn.
Low she lies who blessed our eyes.
Silver and gold have I *none.*
Go he shall. Stay not here.
Up goes the fool, and gets sent down again.

FORMS OF WRITTEN ENGLISH

All forms of language composition are either Prose or Poetry; and these in turn are subdivided rhetorically into certain well-recognized special forms. The following classification shows at a glance the most important of these:

I. PROSE

LETTER WRITING.—Business and public letters, social letters, ceremonial letters and notes.

NARRATION.—Letters, journals, memoirs, biographies, history, travel, news, fiction.

DESCRIPTION.—Descriptions of external objects, of character and its development, of intellectual processes.

EXPOSITION.—Essays, treatises, editorials, reviews, criticisms.

ARGUMENT.—Argumentative essays, debates, briefs, etc.

PERSUASION OR ORATORY.—Orations, addresses, lectures, sermons.

II. POETRY

EPIC AND NARRATIVE POETRY.—The great epics, metrical romances, metrical tales, ballads, pastorals, idylls, etc.

DRAMATIC (including all narrative poetry which presents actors as speaking and acting for themselves).—Tragedy, comedy, farce, opera, melodrama, mask, interlude, etc.

LYRIC.—Odes, sacred and secular songs, elegy, sonnets, simple lyrics.

DIDACTIC.—Moral essays in verse, satiric poetry, etc.

LETTER WRITING, OR CORRESPONDENCE.

A *letter* is a written communication on any subject from one person to another. In other words, it is written conversation, or "speaking by the pen." Letters deserve very careful attention, for no species of composition is more generally used by all classes of persons. Remember that the letter "bespeaks the person," and that many will judge of a person's character and attainments from his correspondence.

The first endeavor of a writer should be to express himself as easily and naturally as in conversation, though with more method and conciseness.

So, before you begin to write a letter, arrange in your mind the ideas you wish to convey; then express them as if you were talking to the person to whom you are writing.

Divisions of a Letter.—In every business or social letter there are five things to consider: the *heading*, the *introduction*, the *body of the letter*, the *complimentary close*, and the *signature*. Business letters should have an introductory address before the salutation.

THE HEADING.—The heading consists of the name of the *place* at which the letter is written, and the *date*. If you write from a city like St. Louis, Boston, or New York, give the door

number, the name of the street, of the city, and of the state. If you are at a hotel or a school, its name may take the place of the door number and the name of the street. If in a small country place, give your postoffice address, the name of the county, and that of the state.

The date consists of the month, the day of the month, and the year.

Leave at least one inch vacant on the top of the first page.

Put on the first line, and to the right, your own postoffice *address;* and, either on the same line or on the next, the *date*—that is, the month, day, and year, thus:

25 Endicott Street, Boston, Mass.,
August 6, 1904.

THE INTRODUCTION.—The introduction consists of the *address*—the name, the title, and the place of business or the residence of the one addressed—and the *salutation.*

The *Salutation* and the *Complimentary Close* should be appropriate to the person addressed. (See list of forms of Salutation and Complimentary Close on page 737).

Titles of respect and courtesy should appear in the address. Prefix *Mr.* to a man's name; *Messrs.* to the names of several gentlemen; *Miss* to that of a young lady; *Mrs.* to that of a married lady. Prefix *Dr.* to the name of a physician, but never *Mr. Dr.; Rev.* to the name of a clergyman, or *Rev. Mr.* if you do not know his christian name; *Rev. Dr.* if he is a Doctor of Divinity, or write *Rev.* before the name and *D. D.* after it.

Salutations vary with the station of the one addressed, or the writer's degree of intimacy with him. Strangers may be addressed as *Sir, Rev. Sir, General, Madam,* etc.; acquaintances as *Dear Sir, Dear Madam,* etc.; friends as *My dear Sir, My dear Madam, My dear Jones,* etc.; and near relatives and other dear friends as *My dear Wife, My dear Boy, Dearest Ellen,* etc. Examples:

Mr. William C. Jones,
Washington, D. C.
DEAR SIR:
Your letter, etc.
American Book Co.,
New York City.
DEAR SIRS:
Kindly send, etc.

THE BODY.—Begin the body of the letter at the end of the salutation, and on the *same* line, if the introduction consists of four lines—you may do so even if the introduction consists of but three—in which case the comma after the salutation should be followed by a dash; otherwise, on the line *below.* (See general observations as to subject matter, style, etc.)

THE CONCLUSION consists of the *complimentary close* and the *signature.* The forms of the complimentary close are many, and are determined by the relation of the writer to the one addressed. In letters of friendship may be used *Your sincere friend; Yours affectionately; Your loving son* or *daughter,* etc. In business letters, use *Yours; Yours truly; Truly yours; Yours respectfully; Very respectfully yours,* etc. In official letters use *I am, with respect, your obedient servant; I have the honor to be your obedient servant,* etc.

The complimentary close often forms part of the last paragraph; at other times it stands separately, and then it usually begins about the middle of the line. Example:

Very sincerely,
Mary E. Shattuck.

A married woman should sign her own given name, but indicate her proper title of address; thus:

Mrs. J. F. Martin.

THE SUPERSCRIPTION, on the outside of the envelope, is the same as the address, consisting of the name, the titles, and the full directions of the one addressed. It should be written very plainly, and include the town, county, state, and country, if it goes abroad.

The number of the postoffice box, or the door number and the name of the street, or the name of the county, may stand at the lower left-hand corner.

Style of Letters.—It makes a considerable difference in our style whether we write as officials or business men, or as individual members of society.

The style shoulud be determined in some measure by the nature of the subject, but in a still greater degree by the relative positions of the writer and the person addressed. On important subjects, the composition is expected to be forcible and impressive, on lighter subjects, easy and vivacious; in condolence, tender and sympathetic; in congratulation, lively and joyous. To superiors, it should be respectful; to inferiors, courteous; to friends, familiar; and to relatives, affectionate.

We may, therefore, usefully distinguish letters into three kinds—*official* or *business* letters and *personal* or *social* letters, and *ceremonial letters* or *notes.*

Official or Business Letters.—These include all those written by a person in the capacity of an officer, a professional man, a merchant, a tradesman, etc. They are classed together because they are mainly subject to the same rules.

In writing business letters, the following rules should be observed:

1. Be very *clear,* so that your exact meaning cannot fail to be understood at first sight. Read your letter over with close attention to see that all your thoughts are correctly, fully, and clearly expressed.

2. Take care that the *handwriting* be legible, else you may get *boots* for *books, matches* for *hatchets* or *latches, two ponies* instead of *one hundred pansies.*

3. Be *brief* and to the point; business men have no time to waste.

4. Confine yourself to *strict business.* If you wish to add matters of friendship, it is well to write them on a separate leaf, that the business portion may be separately filed.

5. Write *grammatical and idiomatic* English, and paragraph and punctuate as in other kinds of writing.

Personal and Social Letters.—Under this head may be placed those letters written by any person in his private capacity as an individual. Such letters may be dictated by friendship, by charity or kindness, by politeness, by respect, by gratitude, by self-interest, or by any other reasonable motive.

Among these are the following:

LETTERS OF FRIENDSHIP are such as are dictated by mutual affection between relatives and friends. They should be natural, easy, frank, without the least affectation. "I wish you to open to me your soul, not your library," said Mme. de Sévigné, who wrote exquisitely herself. Such letters may treat of any subject of common interest to the parties concerned. Their language is that of the heart. Kindness, affection, charity, good-nature should dictate, prudence and common sense supervise them.

LETTERS OF CONGRATULATION are written on occasion of the New Year, a birthday, a preferment, or when a friend has met with some uncommon good fortune, and should be dictated by genuine friendship and sincere esteem, and expressed modestly without any exaggerated praise.

LETTERS OF CONDOLENCE.—These require great skill and care. Act like the humane surgeon who touches the wound gently, and only to heal it. If your correspondent knows the sad news already, sympathize sincerely with him. If you are to announce the bad news yourself, prepare the way slowly; state the news as delicately as you can. Express your grief again before you conclude.

LETTERS OF INTRODUCTION OR RECOMMENDATION require special prudence. Think first whether it is proper to write such a letter at all for such a person. Avoid two dangers: do not offend the applicant for a recommendation, do not deceive your correspondent by exaggerated praise of the one recommended.

If the applicant is *worthy* state his merits, express reasonable confidence in him. If he is *unworthy* or doubtfully worthy, give him a letter which he will prefer not to present; for every such letter is an open letter, which the bearer is expected to read before delivering.

A letter of introduction or recommendation should never be sealed, as the bearer to whom it is given ought to know the contents.

LETTERS OF PETITION should be modest and every way moderate. Ingratiate yourself in a manly way; state your reasons briefly but forcibly; show your appreciation of the trouble your correspondent may be put to in consequence of the favor; promise gratitude.

In answering such letters favorably be brief and show your pleasure at rendering the little service asked. In refusing show how reluctantly you do so; give good reasons for it. Express your hope of finding, some other time, a better opportunity of showing your affection or esteem.

LETTERS OF THANKS should never be neglected when a favor has been received. Express your appreciation both of the favor and of the kindness with which it was bestowed. Hope for an opportunity, not of repaying the person, but of showing your gratitude.

Ceremonial Letters and Notes.—Under this heading may be classed notes of *invitation*, *acceptance*, and *regret*, both formal and informal.

Informal invitations, acceptances, and regrets are simply friendly notes written always in the *first* person. They vary in form to suit the occasion. They should be cordial in tone, but brief, and are in better taste when confined to the subject of the invitation, outside items being permissible only under special circumstances which may require their mention.

An informal invitation should never, under any circumstances, be answered in the third person.

Invitation:—

30 Rampart St.,
May 4th, 1917.

Dear Mr. Brooks:

We would be very pleased to have you dine with us on Monday next, the 12th, at seven o'clock, if disengaged.

Cordially yours,
Helen Clements.

Acceptance:

Eastern Point,
April 29th, 1917.

Dear Mrs. Clements:

I will be most happy to dine with you on Monday, the 12th, at seven o'clock.

Faithfully yours,
Arthur Brooks.

Formal notes are always expressed in the third person, and all answers to such should correspond in form and style.

Although invitations to large affairs are usually printed from engraved plates, a few forms are here given, principally to show the correct forms of reply to the several kinds of invitation.

Invitation to a reception:

Mr. and Mrs. Charles L. Harrington
request the pleasure of your company
on Thursday evening, November tenth,
from eight until eleven o'clock,
896 Fifth Avenue.

Acceptance:

Miss Evelyn Hall
accepts with pleasure
Mr. and Mrs. Charles L. Harrington's
invitation for Thursday evening,
November tenth.

Dinner invitation:

Mr. and Mrs. Henry W. King
request the pleasure of
Mr. and Mrs. Mayhew Marbury's
company at dinner
on Tuesday evening, April tenth,
at eight o'clock,
40 Maple Avenue.

Acceptance:

14 West Street,
March 31st, 1917.

Mr. and Mrs. Mayhew Marbury
accept with pleasure
Mr. and Mrs. Henry W. King's
invitation to dinner on
Tuesday evening, April tenth,
at eight o'clock.

Additional Suggestions.—Always use good paper and black ink. Decorated or highly colored writing papers are in poor taste. Plain white or slightly tinted paper of medium weight is best.

All letters and notes should be written legibly and neatly, carefully punctuated, and absolutely correct as to spelling.

All letters and notes, with a few special exceptions, require a prompt acknowledgment of receipt, if not an immediate answer.

This is especially the case in business letters and those containing enclosures of any kind.

All letters and notes should be courteous. To inferiors in station be kindly; to superiors, respectful; and to equals, friendly.

All letters and notes asking information should be re-read immediately before answering.

OFFICIAL AND TITLED SALUTATIONS

Titles in the United States are either official or academic.

OFFICIAL TITLES

To the President of the United States, an official letter commences, *Sir.*

Conclusion: *I have the honor to remain your most obedient servant.*

Salutation of a social letter: *My dear Mr. President.*

Conclusion: *I have the honor to remain most respectfully* [or *sincerely*] *yours.*

Inscription on envelope: *President Woodrow Wilson.*

To the Vice-President, an official letter begins, *Sir*, or *Dear Sir.*

Conclusion: *I have, Sir, the honor to remain your most obedient servant.*

Salutation of a social letter: *My Dear Mr. Marshall.*

Conclusion: as given for president.

Inscription on envelope: *The Vice-President, Thomas R. Marshall.*

To a Justice of the Supreme Court, an official letter begins and concludes as in the case of a vice-president.

Salutation of a social letter: *Dear Mr. Justice White*, or *Dear Justice White.*

Conclusion: *Believe me, truly* [or *most sincerely*] *yours*, etc.

Inscription on envelope: *Mr. Justice Edward D. White.*

To a Senator, an official letter begins and concludes as to a vice-president.

Salutation of a social letter: *My Dear Senator Lewis.*

Conclusion: as given for a justice.

Inscription on envelope: *Senator Hamilton Lewis* or *To the Hon. Hamilton Lewis.*

To a Member of the House of Representatives, an official letter begins as to a senator.

Conclusion: as in the case of a vice-president.

Salutation of a social letter: *My dear Mr. Clark.*

Conclusion: as given for a justice.

Inscription on envelope: *Hon. Champ Clark.*

To a Member of the Cabinet, an official letter begins and concludes as to a vice-president.

The salutation and conclusion of a social letter are as in the case of a member of the House of Representatives.

Inscription on envelope: *Honorable Robert Lansing, Secretary of State.*

To the Governor of a State, an official letter begins: *Sir.*

Conclusion: *I have the honor, Sir, to remain your obedient servant.*

A social letter begins: *Dear Governor McCall* or *Dear Mr. McCall.*

Conclusion: *Believe me, truly* [or *most sincerely*] *yours.*

Inscription on envelope: *Governor* [or *Hon.*] *Samuel W. McCall.*

To a Mayor, an official letter begins: *Sir* or *Your Honor.*

Conclusion: Same as a governor.

Social letter begins: *My dear Mayor Rockwood* or *Dear Mr. Rockwood.*

Conclusion: Same as a governor.

Inscription on envelope: *His Honor the Mayor of Cambridge, Wendell D. Rockwood.*

CLERICAL TITLES

The Pope—*His Holiness Pope Benedict XV.*

To a Roman Catholic Archbishop, an official or a social letter begins: *Most Reverend and Dear Sir.*

Conclusion: *I have the honor to remain your humble servant.*

Inscription on envelope: *The Most Reverend John J. Keane, Archbishop of Dubuque, Iowa.*

To a Cardinal, whether official or social, a letter begins: *Your Eminence.*

Conclusion: as to an archbishop.

Inscription on envelope: *His Eminence Cardinal Gibbons.*

To a Roman Catholic Bishop, either an official or a social letter begins: *Right Reverend and Dear Sir.*

Conclusion: as to an archbishop.

Inscription on envelope: *To the Right Reverend Philip J. Garrigan, Bishop of Sioux City, Iowa.*

To a Protestant Bishop, an official letter begins as in the case of a Roman Catholic bishop. A social letter begins: *Dear Bishop Lawrence.*

Conclusion: *I have the honor to remain your obedient servant*, or *I remain respectfully* or *sincerely yours.*

Address on envelope: The same as to a Roman Catholic bishop.

To an Archbishop of the Anglican Church, an official letter begins: *My Lord Archbishop, may it please your Grace.*

Conclusion: *I remain, My Lord Archbishop, your Grace's most obedient servant.*

Salutation of a social letter: *My dear Lord Archbishop.*

Conclusion: *I have the honor to remain, my dear Lord Archbishop.*

Inscription on envelope: *The Most Rev. His Grace the Archbishop of York.*

To an Anglican Bishop, an official letter begins: *My Lord.*

Conclusion: *I have the honor to remain your Lordship's obedient servant.*

Salutation of a social letter: *My Dear Lord Bishop.*

Conclusion: *I have the honor to remain, my dear Lord Bishop, faithfully yours.*

Inscription on envelope: *To the Right Rev. the Lord Bishop of Oxford.*

ENGLISH TITLES OF ROYALTY, NOBILITY AND OFFICE

The following list illustrates the various titles used for the different ranks among individuals either in the complimentary address or superscription on the envelope:

1. *In Letters or Conversation.*
2. *The Directions of Letters.*

The Royal Family

The King—

1. Sir; Most Gracious Sovereign; May it please your Majesty.
2. To the King's Most Excellent Majesty.

The Sons and Daughters, Brethern and Sisters of Sovereigns—

1. Sir, or Madam, May it please your Royal Highness.
2. To His Royal Highness the Prince of Wales. To Her Royal Highness the Duchess of Cambridge.

Other Branches of the Royal Family—

1. Sir, or Madam, May it please your Highness.
2. To His Royal Highness the Duke of Cambridge; or, To Her Highness the Princess Mary of Cambridge.

The Nobility

A Duke, or Duchess—

1. My Lord, or My Lady, May it please your Grace.
2. To His Grace the Duke of Bedford; or, To Her Grace the Duchess of Bedford.

A Marquis, or Marchioness—

1. My Lord, or My Lady, May it please your Lordship, or May it please your Ladyship.
2. To the Most Noble the Marquis, or Marchioness, of Westminister.

An Earl or Countess—The same.

To the Right Honorable the Earl, or Countess, of Shrewsbury.

A Viscount or Viscountess—
1. My Lord, or Madam, May it please your Lordship, or, May it please your Ladyship.
2. To the Right Honorable Viscount, or Viscountess, Lifford.

A Baron or Baroness—The same.
To the Right Honorable, the Lord Wensleydale, or The Lady St. John.

The Widow of a Nobleman is addressed in the same style, with the introduction of the word Dowager in the superscription of her letters.
To the Right Hon. the Dowager Countess of Chesterfield.

The Sons of Dukes and Marquises, and the Eldest Sons of Earls, have, by courtesy, the titles of Lord and Right Honorable; and all the daughters have those of a Lady and Right Honorable.

The Younger Sons of Earls, and the Sons and Daughters of Viscounts and Barons, are styled Honorable.

Official Members of the State

A Member of His Majesty's Most Honorable Privy Council—
1. Sir, or My Lord, Right Honorable Sir, or My Lord, as the case may require.
2. To the Right Honorable ——,* His Majesty's Principal Secretary of State for Foreign Affairs.

Ambassadors and Governors—
1. Sir, or My Lord, as the case may be; May it please your Excellency.
2. To his Excellency the French (or other) Ambassador.
3. To his Excellency ——,* Lieutenant General and General Governor of that part of the United Kingdom called Ireland.

Judges—
1. My Lord, May it please your Lordship.
2. To the Right Honorable ——, Lord Chief Justice of England.

The Lord Mayor of London, York, or Dublin, and the Lord Provost of Edinburgh, during office—The same.
1. My Lord, May it please your Lordship.
2. To the Right Honorable ——, Lord Mayor of London. To the Right Honorable ——, Lord Provost of Edinburgh.

The Lord Provost of every other town in Scotland is styled Honorable.

The Mayors of all Corporations (excepting the preceding Lord Mayors), and the Sheriffs, Aldermen, and the Recorder of London, are addressed Right Worshipful; and the Aldermen and Recorders of other Corporations, and the Justices of the Peace, Worshipful.

The Parliament

House of Peers—
1. My Lords, May it please your Lordships.
2. To the Right Honorable the Lords Spiritual and Temporal, in Parliament assembled.

House of Commons—
1. May it please your Honorable House.
2. To the Honorable the Commons of the United Kingdom of Great Britain and Ireland.

The Speaker of Ditto—
1. Sir, or Mr. Speaker.
2. To the Right Honorable James W. Lowther, the Speaker of the House of Commons.

A Member of the House of Commons Not Ennobled—
1. Sir.
2. To Thomas Hughes, Esq., M.P.

NARRATION

Narration is a species of composition which relates the particulars of a real or fictitious event in the order of their occurrence. In a wider meaning, narration is the statement of successive facts. In a story or drama the *plot* is the series of incidents which form the skeleton of the story.

If the subject deals with real facts, as in biography, or history, or news, the rule of *fidelity* to the truth is essential. It requires that not only the main facts shall be true as they are narrated, but also that all the striking and important details be faithfully stated as they are known to have occurred or happened.

Biography.—After the *letter*, the simplest form of composition is biography. The order of events from youth to age is established.

This style of composition is strongly to be recommended for beginners. It affords excellent practice for all. It promotes a habit of putting things in order.

Outline scheme of biography:—
1. When was he born?
2. Where was he born?
3. Who were his parents?
4. Where was he educated?
5. Whom did he marry?
6. What was his profession?
7. What great work did he do?
8. When and where did he die?
9. Where was he buried?

Answer each question in a complete sentence.

You have nine statements in chronological order.

Each of these can be expanded into one or more paragraphs.

Fiction and Drama.—If the composition is a story or drama, the principal requirements involve the following:

The story should develop one or more of the following: plot, situation, character.

The story should have interest.

1. It should begin attractively and as directly as possible.
2. It must move, and not simply "mark time."
3. It may be made effective by dramatic situations and turning points.
4. It may use description, but the description must be closely connected with the story and must not hinder the movement.
5. It should discriminate in the number and the importance of details.
6. It may make effective use of suspense and suggestion.
7. It should have no inconsistency in the speech or the actions of the characters.
8. It should have an effective ending.

News, or the Newspaper "Story," is another very important form of narrative. The newspaper is the great popular educator of the day, and in its columns are found not only excellent examples of vivid and telling narratives, but frequently excellent types of spontaneous writing.

News and news reporting require accuracy, clearness, brevity, and a style that either charms, or compels interest. Indeed, it too frequently happens that to secure the element of interest practically all else is sacrificed.

Reporting and news writing are best learned by careful study of the daily papers, and from constant practice. Shorthand is an invaluable

*Here write the name, and specify the title or rank of the person addressed, as "The Right Honorable the Earl of Wimbourne."

aid in securing the exact words of the speaker if the news takes the form of an interview, or report of a public address or meeting.

The relation of the "facts" and "story" may be illustrated in the following:

Report of exact words of the speaker:—

"*I assure you, my* friends, that *I* for *my* part, *will* do all *I* possibly *can* to resist *this* measure. *You know* that *I have* always been opposed to it; as recently as *yesterday I spoke* against it *here* in *this* very hall. *Do you* think that the people of this country *will* tolerate such injustice? *I am* sure they *will* not."

How the newspaper report appeared:—

He assured his friends that *he* for *his* part *would* do all *he* possibly *could* to resist *that* measure. *They knew* that *he had* always been opposed to it; as recently as *the day before he had spoken* against it *there* in *that* very hall. *Did they* think, he asked, that the people of this country *would* tolerate such injustice? *He was* sure they *would* not.

EXPOSITION

Exposition is a form of composition designed to explain. Its important characteristic is clearness, and it, therefore, makes large use of illustration.

The main points may be stated in various ways in order to make them clear.

Essays and editorials are among the best known forms of exposition.

Essay.—An *essay* is a short composition upon any subject. The subject may be of any kind whatever, one fit for treatment, and with great fulness, in any of the species of discourse described above, or one without sufficient dignity for such treatment. No other species of writing ranges over so wide and varied a field of topics—nothing less than that of all others combined—and none other allows such freedom and diversity in the handling.

In *style of thought* the essay may be dreamy and semi-poetical, and charm by its beauty, it may be simply instructive or critical, it may blaze with its brilliancy, sting with its satire, convulse with its humor, convince with its logic, inflame with its appeal and move to instant duty. The author may wander off in leisurely excursions to the right and the left, and load his pages with gleanings by the way; or, like the orator, he may keep his eye on the point he would reach, and move, with the directness of an arrow's flight, toward it.

The *style of expression* should fit the thought, and October woods are not more varied in color than this department of literature in utterance.

Outline of the Essay.—1. Give a clear definition of the subject or proposition to be discussed, amplified, paraphrased, or explained.

2. Set out the reason for, or the truth of, the proposition.

3. Add the confirmation of further proofs, including demonstration of the unreasonableness of the contrary.

4. Illustrate the truth of the proposition by comparison or analogy from nature or art.

5. Give direct examples or instances to corroborate the truth.

6. Quote the testimony of standard authors.

7. Conclude by summing up, with pertinent observations.

Remember that all this working to a formula is only a training in the habit of clear thinking —a mental discipline.

When you can do without the formula, and not till then, you will begin to be a writer.

Editorials are, in point of fact, simply little essays, usually following closely the news or issues of the day. Their function is to elucidate, summarize, inform, persuade, or merely comment. In their highest form they are to prose writing what the sonnet is to verse; but it must be confessed that numerous editorials are so completely dominated by the so-called "editorial policy" of newspaper owners, or colored by one of the various hues of partisanship, that their otherwise beneficent influence and power are largely neutralized.

Description.—We mean by a *description* the delineation of some object or scene. Narration deals with successive facts; description with objects that exist at the same time. We rarely find any literary production of great length which is entirely descriptive; but descriptions are often introduced into narratives with happy effect.

Sometimes they serve the purpose of making the narration impressive, by moving the passions of the reader. At other times they are intended to make the events more intelligible. Thus we have seen that some narratives of battles are hard to follow because the writer has neglected to give us a clear description of the battle-field.

Descriptions frequently serve as ornaments, affording an agreeable variety to the narration, and presenting scenes of striking interest to the imagination.

RULES.—The governing rules in description are the following:

1. In every good description a point of view should be established.

2. The description should be governed by the point of view.

3. The general outline of the picture should, ordinarily, be given first.

4. The number of details should be so few and so insignificant as to make a vivid picture.

5. The order of the details should be determined by the character of the object described.

Argument.—This form of composition is designed to prove the truth or the falsity of a proposition.

A *brief* is a summary of an argument showing the development of the argument by a series of headings and sub-headings.

The first step in the argument should be to define the terms of the proposition or to determine the facts in the case.

State reasons to establish facts.

The conclusion should be warranted by the premises.

Illustrations may be used effectively, but not conclusively.

Analogy should be used for illustration, not as a basis for conclusions.

Arguments should usually be arranged in the order of their strength, the strongest last.

POETRY AND POETICS

Poetry is usually classified as epic, lyric, dramatic, and didactic.

Epic Poetry is that which deals with the life and adventures of some real or mythic personage, called a hero.

1. The *great epic* is considered the highest effort of poetic talent, on account of the loftiness of its conceptions, the dignity of its character, and the difficulty of its execution. Few

epic poems have gained general admiration. Those most highly prized are Homer's *Iliad* and *Odyssey;* Virgil's *Æneid;* Milton's *Paradise Lost;* and Tasso's *Jerusalem Delivered.*

2. The *Metrical Romance* differs from the great epic in its theme, which is less serious; its metre, which is lighter; and its control of events, which is mainly human; the love element is more prominent in this form of the epic. Examples: Scott's *Marmion* and *The Lady of the Lake.*

3. The *Tale* is a simple form of narrative poetry telling a complete story. Examples: Chaucer's *Canterbury Tales;* Tennyson's *Enoch Arden.*

4. The *Ballad* is a direct, rapid, and condensed story, having peculiarities of phrase and poetic accent. Examples: *Chevy Chase;* Coleridge's *Ancient Mariner.*

5. *Pastorals* and *Idylls* have a great deal of description, often of simple country scenes, mingled with the narrative. Examples: Goldsmith's *Deserted Village;* Tennyson's *Idylls of the King.*

Dramatic poetry tells a story by means of characters speaking and acting in such a way as to develop a plot. The drama is divided into acts, often five, the fifth act showing the results of the plot which has been developing.

The classes of dramatic poetry are tragedy and comedy.

Tragedy deals with the grave situations and problems of life and engenders in the spectator noble emotions.

Comedy deals with the pleasanter and more trivial side of life and chooses its subjects from everyday follies, accidents, or humors.

Lyric poetry expresses the deepest emotions of sentiment of the poet. The lyric, as the word suggests, was originally designed to be sung to the music of the lyre.

Lyric poetry includes five classes, as follows: *Song* may be either sacred or secular.

The *Ode* is the loftiest form of lyric, and expresses great range and depth of feeling. This range of emotion often varies the metre. Examples: Tennyson's *Ode on the Death of the Duke of Wellington;* Lowell's *Commemoration Ode.*

The *Elegy* laments the fleeting condition of human affairs. Examples: Gray's *Elegy Written in a Country Churchyard;* Milton's *Lycidas;* Tennyson's *In Memoriam.*

The *Sonnet* is a short poem of fourteen iambic pentameter lines, and had originally a prescribed arrangement of rhyming lines. The great English sonnet writers are Shakespeare, Milton, Wordsworth, and Mrs. Browning.

Many lyrics have none of the special aims already mentioned. These may be called *Simple* lyrics. Example: Burns's *To a Daisy.*

Didactic verse is not the highest type of poetry. Its aim is not to give pleasure, but to instruct. Example: Pope's *Essay on Man.*

POETICS

Poetry differs from prose in three particulars: in its *purpose,* in its *style,* and in its *form.*

The chief object of poetry is to give pleasure. Of all literature it is the most spontaneous because addressed particularly to the feelings.

It has its own diction and imagery, conforming to the order, gradations and subtleties of its thought. Like other forms of genius, too, it is permitted certain liberties and variations of language or expressions in order to avoid monotony and maintain the life and music of the verse. These are more strictly rhetorical, however, and next in importance to the poetic *content* is poetic *form.*

By poetic *form* we mean the mould and measure whereby, in English, poetry gets itself into the expression adapted to produce its designed effect.

Metre.—All impassioned language, as in eloquence for instance, tends to fall into a more or less regular rhythmic swing. In poetry, which is both impassioned and imaginative, this rhythm is timed to definite lengths and called *metre,* which is the Greek word for measure.

The unit of poetic measure is the foot. A foot is a combination of syllables, two or three distinguished, after the Greek, as long and short, but more truly accented and unaccented, because our syllabic values, unlike the Greek, are more accentual than quantitative. A variety of poetic feet are employed in English, whose names and values are derived from Greek prosody.

Poetic Feet.—For brevity of description a notation is used to designate the foot: the sign (—) for a long, and (⏑) for a short syllable. The kinds of feet in most common English use, here marked by their signs and illustrated by a word, are: Iambic or Iambus, a short and a long (⏑ —, e, g, forbid); Trochaic or Trochee, a long and a short (— ⏑, e. g. lightly); Spondaic or Spondee, two longs (— —, e. g. all day); Anapestic, two shorts and a long (⏑ ⏑ —, e. g. arabesque); and Dactylic, a long and two shorts (— ⏑ ⏑, e. g. silently).

Other feet, such as Tribrach, three shorts (⏑ ⏑ ⏑, e. g. rapidly); Amphibrach, short long short (⏑ — ⏑, e. g. tremendous), and Amphimacer, long short long (— ⏑ —, e. g. undismayed), are used less frequently, and only as blends with other measures.

Verse.—The first combination of poetic feet results in the verse or line, somewhat analogous to the clause in a prose sentence. The word verse means by derivation a *turning;* perhaps because where it reaches a certain designed length the writer turns back and begins a new line. The kinds of verse employed are named by Greek names according to the number of feet they contain; and along with this, if the measure is fully described, is named the kind of foot.

The same notation as given above is kept up through the line, the feet being separated by an upright line. Thus, taking the Iambic foot as unit, we note: Monometer, one-measure, or one foot long (⏑ —); Dimeter, two-measure (⏑ —|⏑ —); Trimeter, three-measure (⏑ —|⏑ —|⏑ —); Tetrameter, four-measure (⏑ — | ⏑ — | ⏑ — | ⏑ —); Pentameter, five-measure (⏑ —|⏑ —|⏑ —| ⏑ —|⏑ —); and Hexameter, six-measure, (⏑ —|⏑ —|⏑ —|⏑ —|⏑ —|⏑ —). English names are sometimes used, as 8 and 7, or fourteeners.

A few poetic lines may here be given, with their notation, by way of illustration:

⏑ — ⏑ — ⏑ — ⏑ —
I wan|dered lone|ly as | a cloud
(Iambic tetrameter)

— ⏑ — ⏑ — ⏑ — ⏑
Heard the | lapping | of the | water
(Trochaic tetrameter)

— ⏑ ⏑ — ⏑ ⏑ — ⏑ ⏑ — ⏑ ⏑ —
This is the | forest pri|meval; the | murmuring | pines
⏑ ⏑ — ⏑
and the | hemlocks
(Dactylic hexameter)

⏑ — ⏑ ⏑ — ⏑ ⏑ — ⏑ ⏑ —
Oh, young | Lochinvar | is come out | of the West
(Anapestic tetrameter)

— ⏑ ⏑ — ⏑ ⏑
One more un|fortunate
(Dactylic dimeter)

⏑ — ⏑ — ⏑ — ⏑ ⏑ ⏑ —
This was|the no|blest Ro|man of | them all
(Iambic pentameter)

At some place within a long line, pentameter or hexameter, occurs a natural pause, called the *cæsura*. The continual varying of the place of the cæsura is one means of breaking up the monotony to which blank verse (Iambic pentameter unrhymed) tends.

Stanzas.—The next step of procedure as the combination of poetic elements goes on from the single verse, is some form of *stanza* structure.

The simplest approach to the stanza, employed principally in what is called Heroic verse, is the couplet (also called the Heroic couplet), two lines, Iambic pentameter, rhymed, and generally pausing at the end of the second line. They form only partially a stanza, however, because these couplets go on, according to the requirements of the thought, to group themselves in paragraphs after the manner of prose. Pope is the great master of the heroic couplet.

Sometimes, if the lines are long, a poem is made up of couplet stanzas, as in Tennyson's *Locksley Hall.*

There are certain standard stanza structures, such as the Elegiac stanza, four lines Iambic pentameter, rhymed either in pairs or alternately, of which Gray's *Elegy* (rhymed alternately) is the type; the Ballad stanza, four lines Iambic pentameter and trimeter alternating, with second and fourth lines rhymed together, sometimes also first and third; various hymn stanzas, designated Long Metre (L. M.), Common Metre (C. M.), Short Metre (S. M.), 8 and 7, 6 and 4, etc., which can be studied in any hymn-book; and most elaborate of all, the Sonnet, a fourteen-lined stanza which is also a whole poem, with a rather intricate rhyme scheme.

Generally speaking, however, the liberties and varieties of stanza structure, as to kind of measure, length of line and stanza itself, combination of long and short line, and rhyme scheme, is almost unlimited.

Rhyme.—A new poetic element enters into the stanza: the element of *rhyme*. The most prominent regulative feature of English lyric verse, perhaps, is the rhyme by which recurring periods are grouped. Technically speaking, there are three kinds of rhyme, only one of which plays an important, or at least essential part, in modern English poetry.

1. *Beginning rhyme*, or alliteration (e. g. the mother of months), which in Anglo Saxon poetry was the main principle of verse, but is now introduced only furtively and delicately.

2. *Middle rhyme*, or assonance, wherein only the vowels rhyme (e. g. blarney, charming), which is introduced with even more caution than alliteration.

3. *End-rhyme*, which is so constant and essential a principle of the stanza that it needs no further definition here.

In the skillful management and disposition of the end-rhymes, to produce its poetic effects without monotony or undue obstrusiveness, there is room for the finest poetic taste and workmanship. On single rhymes (e. g. face, embrace), double rhymes (e. g. rally, sally), and triple rhymes (e. g. pentameter, sham metre), which explain themselves, there is no occasion to enlarge.

The arrangement of lines in a stanza is indicated, in brief notation, by letters of the alphabet. Thus *a a b b* indicates a four-line stanza in which the first and second lines rhyme, and the third and fourth; *ab ab*, a stanza in which the rhymes alternate; *a b b a*, a stanza like that of Tennyson's *In Memoriam*, in which this arrangement is reversed.

In this way, with the use of the other notation mentioned, a complete description of poetic construction, from foot to stanza, may be made in very short space.

How Rhythm is Applied.—Lyric poetry, of which the type is the song; was originally designed to be associated with music. It is in this class of poetry, especially, that the stanza form and the rhyme system prevail; but besides the song and the ballad, which most suggest musical accompaniment, there are the ode, the elegy, the sonnet, the didactic poem, and many others, with which music, except in the natural melody of the verse, has little to do.

In epic poetry, the vehicle of great national deeds and ideals, and the enshrining of deep religious and moral truths, the verse employed is generally blank verse (i. e. unrhymed verse), in paragraphs instead of stanzas, and generally Iambic pentameter. For less sublime or universal purposes, however, this epic class has been enlarged to include narrative and romantic poetry, often rhymed, as in Chaucer's *Canterbury Tales* and Scott's *The Lady of the Lake;* and sometimes in stanzas, as in Spencer's *Fairy Queene.*

Dramatic poetry, designed for representation on the stage, and written in blank verse of a less severe and rigid artistic kind than in the epic, is modeled more after the natural rhythm of impassioned speech. The range and tone of such dramatic verse is very generous and elastic; from the free and colloquial, as in Browning's dramatic monologues, up to the so-called closet drama, designed to be read rather than played, wherein the artistic demands are as subtle and exacting as in the epic, and the sentiment generally more intense.

While, therefore, the ancient classification remains fundamental and true, the modern art of printing and the discontinuance of the custom of reading aloud, have operated to enlarge the scope of poetry within these elemental lines till every requirement of impassioned and imaginative utterance is freely open to it, in vital and enduring forms.

WORDS AND PHRASES FROM THE MODERN FOREIGN LANGUAGES.

Including proverbs, maxims, quotations, mottoes, idioms, allusions, references, and numerous terms used in law, literature, cookery, the drama, social life, and everyday affairs.

KEY TO PRONUNCIATION

ä, as in farm, father; *á*, as in ask, fast; *a*, as in at, fat; *ā*, as in day, fate; *â*, as in care, fare; *e*, as in met, set; *ē*, as in me, see; *ĕ*, as in her, ermine; *i*, as in pin, ill; *ī*, as in pine, ice; *o*, as in not, got; *ō*, as in note, old; *ô*, as in for, fought, *oo*, as in cook, look, *ōō*, as in moon, spoon; *u*, as in cup, duck; *ū*, as in use, amuse; *û*, as in fur, urge; *th*, as in the, though; *y*, as in yet, you; *ow*, as in cow, now; *ng*, as in sing, ring; *ch*, as in church, choose.

FOREIGN SOUNDS

ö cannot be exactly represented in English. The English sound of *u* in *burn* is perhaps the nearest equivalent to *ö*. *ü* cannot be exactly represented in English. The English sound of *u* in *luke* and *duke* resembles the original sound of *ü*. N represents the nasal tone (as in French) of the preceding vowel, as in encore (*äN-kôr'*). K represents *ch*, as in German *ich, ach*. *zh*, sound of *s* in *pleasure*. *j* and *g* before *i* or *e* in Spanish, strongly aspirated *h*.

Phrases not designated are from the French; those from other languages are distinguished thus: (Ger.)—German; (It.)—Italian; and (Sp.)—Spanish.

a bas (*á bä'*), down.
a bas le traître (*á bä'le tretr'*), down with the traitor.
a beau jeu beau retour (*á bō zhö' bō retōōr'*), one good turn deserves another.
a bon chat, bon rat (*á bôN rá'*), (to a good cat, a good rat), well matched; set a thief to catch a thief.
a bon marché (*á bôN mär shā'*), cheap.
abonnement (*á bôn mäN'*), subscription.
a bras ouverts (*á brázōō ver'*), with open arms.
abrégé (*á brā zhā'*), abridgment.
absence desprit (*áp sāNs des prē'*), absence of mind.
a causa persa, parole assai (It.), (*á kä' ōō zä per'sa, pä rô'lääsä'ē*), when the cause is lost, there is enough of words.
accueil (*á kö'ē*), reception; greeting; welcome.
à charge (*á shárzh'*), at expense.
à cheval (*á she vál'*), on horseback.
à compte (*á kôNt'*), on account.
à corps perdu (*á kôr per dū'*), headlong; neck or nothing.
à coup sur (*á kōō sür'*), with certainty; surely.
à couvert (*á kōō ver'*), under cover, protected, sheltered.
acqua Tofana (It.), (*á kwä tō fä'nä*), a subtle poison.
à demi (*á de mi'*), by halves.
à dessein (*á de sâN*), designedly.
à deux mains (*á dö mâN'*), (for both hands), having a double office or employment.
adieu (*á dēö'*), (I commit you to God), good-bye.
adieu, la voiture, adieu, la boutique (*á dēö', lá vwá tür', á dēö lá bōō tēk'*), (good-bye, carriage; good-bye, shop), all is over.
à discrétion (*á dēs krā sēôN'*), at discretion, unrestrictedly.
à droite (*á drwát'*), to the right.
affaire d'amour (*á fer dá mōōr'*), a love affair.
affaired'honneur (*á fer dô nör'*), an affair of honor, a duel.
affaire du coeur (*á fer dü kör'*), an affair of the heart, a love affair.
affiche (*á fēsh'*), a placard; a notice; bulletin.
affreux (*á frö'*), frightful.
à fin (*á fäN*), to the end or object.
à fond (*á fôN'*), to the bottom; thoroughly.
à forfait (*á fôr fe'*), by contract, by the job.
à gauche (*á gōsh'*), to the left.
à genoux (*á zhe nōō*), on one's knees.
agneau (*á-nyō*), lamb.
à grands frais (*á gräN fre'*), at great expense.
a haute voix (*á ōt vwá*), loudly; openly.
a huis clos (*á wē klō'*), (with closed doors), secretly; in camera.
aide-toi, et le ciel t' aidera (*ed twá', ā le sēel ted rá'*), help yourself, and Heaven will help you.
air distingué (*er dēs tâN gā'*), a distinguished appearance.
air noble (*er nôbl'*), a distinguished, patrician air, manner, or presence.
a la (*á lá*), **au** (*ô*), **aux** (*ô*).—With; according to; after the manner of; as *huitres aux champignons*, oysters with mushrooms.

If a dish is cooked, or served, or made, with anything as an ingredient or garnish, the dish may be said to be "*á la*" that substance. So it may be possible to ascertain the meaning of phrases not given below by looking elsewhere in the vocabulary under the word used with the words "*a la*."

à l'abandon (*á lá bäN dôN'*), disregarded, uncared for.
à la béarnaise (*á lä bā-är-nāz'*).—With a sauce of tarragon vinegar in which shallots have been boiled till it is reduced, then combined with egg yolks and butter, and beaten in a bain-marie, then seasoned with red pepper and lemon juice.
à la béchamel (*á lä bā-shä-mel'*).—After the fashion of Béchamel (a French gastronomer); said of a sauce (see Bechamel); also prepared or served with this sauce.
à la belle étoile (*á lá be lā twál'*), under the canopy of Heaven; in the open air.
à la Bercy (*á lá bâr-sē'*).—Served with béarnaise sauce, stuffed green pepper and stuffed tomato.
à la bigarade (*á lá bē-gä-räd'*).—Flavored with (Seville) orange juice or peel.
à la bonne femme (*á lá bôn fám*).—Of, or in the style of, the housewife; specifically said of a kind of maigre soup made with fish, bouillon, legumes, and an assortment of vegetables.
à la bonne heure (*á lá bô nör'*), well-timed, in good time; favorably; good.
à la bordelaise (*á lä bôr-de-lāz'*).—With Bordeaux wine; said of various preparations containing it; as of a sauce, with garlic, shallots, or onions, chopped mushrooms, and a piece of marrow; also with sauce a la bordelaise.
à la bourguignotte (*á lä boor-gē-nyot*).—Generally prepared with the addition of red wine of Burgundy, or of Bordeaux, or of the Midi (*i.e.*, meridional provinces of France). At Bordeaux, or when made elsewhere with Gironde wine, the dish would be *à la bordelaise*.
à la caledo'nian (*á lä*).—Boiled slowly in plain water and then baked with dressing of butter, chopped parsley, and a little lemon juice; said of finnan haddie when so cooked.
à la Camerani (*á lä kä-mä-rä'nē*).—After the fashion of Camerani; said of a kind of rich chicken-liver soup.
à la campagne (*á lá käN pány'*), in the country.
à la carte (*á lá kárt'*), by the card.
à la Chateaubriand (*á lä shä-tō-brē-äN'*).—With maitre d'hotel butter.
à la chevreuil (*á lä she-vrû'y'*).—Served with a savory sauce; said of fillets of beef.
à la chipolata (*á lá chē-pō-lä'tä*).—Containing an addition of the strongly flavored Italian sausages, or the mince with which they are filled.
à la chiffonade (*á lá shĕ-fo-nád'*).—See chiffonade.
à la cocotte (*á lä kō-kot'*).—Baked (as eggs) in a cocotte, with butter and cream, or with cheese, or the like, and served in a cocotte.
à la crapaudine (*á lä krä-pō-dēn'*).—Like a crapaudine (the flat piece of iron on which a grate pivot rests;) said of grilled chicken, pigeon, etc., when prepared by boning, removing the legs and wings, and pressing flat.
à la Créole (*á lä krä-ōl*).—With tomatoes.
à la Croissy (*á lä krwä-sē'*).—Containing carrots in quantity, or at least strongly flavored with them; said specifically of a puree of onions, carrots, turnips, and parsnips stewed in coulis. According to others, containing turnips in quantity, or strongly flavored with them.
à la daube (*á lá dōb*).—Stewed in daube; said specifically of dishes cooked with small square pieces of salt pork, the round slices of carrots, glaced onions, and turnips.
à la Dauphiné (*á lä dō-fē-nā'*).—With various vegetables, spinach, lettuce, leek, onions, sorrel, beets, etc.; said of a kind of soup.
à la Dauphinoise (*á lä dō-fē-nwäz'*).—Generally, sauced over with a thick sauce (or with egg yolk), breadcrumbed, and then fried.
à la dérobée (*á lá dā rô bā*), stealthily.
à la diable (*á lä dē-á'bl*).—Deviled.
à la faveur (*á lá fá vör'*), by the favor of.
à la financière (*á lä fē-nâN-syär'*).—With extract of truffles (literally, after the style of a financier); said

of a variety of espagnole sauce, and of dishes served with it.

à la Flamande (*ä lä flä-mänd'*).—Containing cabbage, but more particularly Brussels sprouts, and, usually turnips and carrots cut in big slices.

à la Florentine (*ä lä flō-rän-tēn'*).—See à l'Italienne.

à la Française (*ä lä frän sez*), in French fashion.

à la Génevoise (*ä lä zhā-ne-vwäz'*).—Cooked with champagne; said of certain dishes of fish.

à la godiveau (*ä lä gō-dē-vō*).—With balls made of mincemeat, usually of veal.

à la Grecque (*ä lä grek'*), after the Greek fashion.

à la Holstein (*ä lä hōl'stīn*).—Fried, and served with a fried egg, sardelles, capers, pickled beets, and pickles, and sometimes scraped horse-radish.

à la Jardinière (*ä lä zhär-dē-nyär'*).—Made with a typical collection of cooked vegetables, as soups, ragoûts, and removes. See jardinere.

à la julienne (*ä lä zhü-lyen'*).—With various vegetables sliced in strips, as carrots, turnips, leeks, onions, celery, lettuce, tarragon, sorrel; said especially of a kind of rich stock soup. Also said of potatoes cut in very slender strips and fried crisp floating in hot fat.

à l'Algérienne (*ä läl-zhā-rē-en'*). Cooked with slices of raw ham; said of a preparation of fowl.

à la Languedoc (*ä lä läng-dok'*).—Cooked with or in olive oil; with olive oil.

à l'Allemande (*ä läl-mänd'*).—Having a German provincial peculiarity of preparation, as a garnish of sauerkraut, prunes stewed in wine, quenelles of potatoes, etc.

à la Loren'zo (*ä lä*).—Made of minced crab meat, put on toast spread with anchovy paste, then all covered with parmesan cheese and bread crumbs, buttered, browned in the oven, and served.

à l'Alsacienne (*ä läl-sä-syen'*).—With pork and frankfurters; also with onions and pork.

à la lyonnaise (*ä lä lē-ō-nāz'*).—With flaked or sliced fried onions; as, potatoes *à la lyonnaise*, or lyonnaise potatoes; sauce *à la lyonnaise*, or Lyons sauce, that is, espagnole sauce with flaked onions fried in oil.

à la macedoine (*ä lä mä-sä-dwän'*).—Made with or of a typical collection of green vegetables, mostly in white sauce; also applied to collections of ripe fruit imbedded in jellies, etc.

à la Maintenon (*ä lä man-te-nôn'*).—A term variously used to designate a mode of cooking mutton or lamb chops; as, (*a*) wrapped in caul; (*b*) garnished with cockscombs and truffles; (*c*) served with a soubise; (*d*) served with financière sauce; (e) served with d'Uxelles sauce, etc.

à la maître d'hôtel (*ä lä mā'tr dō-tel'*).—Prepared by a substantial, but homely, modest sort of cooking. Also served with maitre d'hotel butter.

à la Marengo (*ä lä mä-ren'gō*).—With some garlic and oil.

à la Marseillaise (*ä lä mär-sāy-āz'*).—With Marsala wine.

à la Ma'ryland (*ä lä*).—With a sauce of butter and cream, with or without wine. It is like à la Newburgh, but less rich.

à l'Américaine (*ä lä mä rē ken'*), after the American fashion.

à la Meyerbeer (*ä lä mä-ûr-bâr'*).—Shirred and served with broiled kidney and truffle sauce; said of eggs.

à la Milanaise (*ä lä mē-lä-nāz'*).—See à l'Italienne.

à la mode (*ä lä môd'*), in the fashion; according to the custom or fashion.

à la mode de Caën (*ä lä mōd de kän*).—A term used to designate tripe prepared with vegetables, leeks, wine cognac, etc.

à la Napolitaine (*ä lä nä-pō-lē-tän'*).—See à l'Italienne.

à la neige (*ä lä nāzh'*).—In some form that suggests snow, as with white-of-egg froth, or in balls of white boiled rice, or the like.

à la New'burgh (*ä lä*).—With a sauce made of cream, egg yolks, Madeira or sherry wine, and butter shaken in a dish over a slow fire until they thicken. Said also of this sauce.

à l'Anglaise (*ä län glez'*), after the English fashion.

à la nivernaise (*ä lä nē-vär-nāz'*).—Containing a nivernaise; said of a kind of soup à la julienne. See nivernaise.

à la Normande (*ä lä nôr-mänd'*).—Generally, with apples in the composition of the dish in some shape or other.

à la Parisienne (*ä lä pä rē zēen'*), after the Parisian fashion.

à la Périgord (*ä lä pā-rē-gôr'*).—Flavored with, or consisting of, truffles—alluding to the circumstance that these mushrooms grow of excellent size and quality in the province of Perigord.

à la Polonaise (*ä lä pō-lō-nāz'*).—Having red beets or red cabbage, so as to have their juice, color, and taste, as Polish ragoût, or borsh, which is the type of dishes *à la Polonaise*.

à la poulette (*ä lä poo-let'*).—With white velouté sauce.

à la printanière (*ä lä pran-tä-nyär'*).—Made with a typical collection of cooked early or spring vegetables; of a somewhat wider application than à la jardinière.

à la Provençale (*ä lä prō-vän-säl'*).—Generally, prepared with more or less of olive oil, and flavored with garlic.

à la Reine (*ä lä rän*).—Of, or after the style of, the queen; said specifically of a kind of chicken soup [*potage à la reine*, (*pō-tāzh' ä lä rän*)] containing white meat of chicken pounded and rubbed to a powder.

à la Ro'land (*ä lä*).—Made of minced lobster meat in the same manner as *à la Lorenzo* dishes of crab meat. See à la Lorenzo.

à la Saint Cloud (*ä lä san'kloo*).—With sliced truffles; said of a kind of velouté sauce.

à la serviette (*ä lä ser-vyet*).—Served in or on a napkin as braised truffles.

à la Soubise (*ä lä soo-bēz'*).—Generally containing onions in quantity; or, at least, strongly garnished and flavored with them; especially, served with a white onion sauce used with lamb or mutton.

a la Sourdine (*ä la sōōr dēn'*), silently; with bated breath.

à la tartare (*ä lä tär-tär'*).—With tartare sauce, or a sauce of similar ingredients. Also, said of a steak chopped and garnished with onions, pickles, pickled beets, sardelles, and yolk of egg, to be eaten raw.

à la Tartufe (*ä lä tär tüf*), like Tartufe, the hypocritical hero of Molière's comedy, Tartufe, hence hypocritically.

à la turque (*ä lä türk*).—Shirred and served with chicken livers and mushrooms; said of eggs. Also boiled with rice and saffron; said of chicken.

à l'Aurore (*ä lō-rōr'*).—With a pink sauce made by coloring velouté sauce with lobster coral or Armenian bole. Also said of sliced hard-boiled eggs put in a dish, covered with velouté, sprinkled with grated egg yolk, and baked.

à la vert pré (*ä lä vâr prā*).—Colored green with vegetables, as with a puree of spinach.

à la Viennoise (*ä lä vyä-nwäz'*).—Applied to dishes usually and typically prepared in the Austrian capital, such as the dumplings termed nockerlin, quenelles of potatoes, and others.

à la Villeroi (*ä lä vēl-rwä'*).—With atelets sauce. Also, said of a poached egg put in a thick white sauce, then covered with egg yolk and bread crumbs, and fried.

à la vinaigrette (*ä lä vē-nē-gret'*).—With vinaigrette sauce.

albuon vino non bisogna frasca (It.), (*äl bwôn vē' nō nōn bē zō' nyä fräs'kä*), good wine needs no bush.

à l'envi (*ä län vē'*), with emulation.

à l'espagnole (*ä lä-spä-nyōl'*).—Made savory with espagnole sauce; specifically, served with a garnish of onions, garlic, green peppers, mushrooms, tomatoes, and minced ham cooked together, and bound with espagnole sauce.

à l'extremité (*ä lek strä mē tä'*), at the point of death; without resource.

al fresco (It.), (*äl frās'ko*), in the open air.

alguazil (Sp.), (*äl gwä zēl'*), a Spanish constable.

à l'huile (*ä-lwēl*).—In olive oil; with olive oil dressing.

Alici (*ä-lē'chē*).—Anchovies, or a similar small fish preserved in oil according to the Italian fashion.

à l'imperatrice (*ä lan-pä-rē-trēs'*).—Said of shirred eggs served with a slice of pâté de fois gras upon each egg.

à l'improviste (*ä län prô vēst'*), unawares, on a sudden.

à l'Irlandaise (*ä lēr-län-dez'*).—Containing potatoes in some form, and often cabbage, etc., in mass or as a prevailing garnish.

à l'Italienne (*ä lē-tä-lē-en'*).—Generally made of, or garnished with, savory macaroni, or paste of that kind, or with ravioli; or made savory with Parma cheese.

all'alba (It.), (*äl läl'bä*), at daybreak.

alla Siciliana (It.), (*äl lä sē chē lē ä'nä*), in the Sicilian manner; in shepherd's dress.

allégresse (*ä lä gres'*), liveliness; geniality.

allemande (*äl män d'*), a kind of German dance.

Allemande sauce (*äl-mänd'*).—Veloute sauce, with the addition of essence of mushrooms, cream, and a leason, or binding, of yolk of eggs.

alles hat seine Zeit (Ger.), (*ä les hät zīne tsīt'*), all in good time.

allez-vous en (*ä lā vōō zän'*), away with you, be off.

allons (*ä lôn'*), come on.

allons donc (*ä lôn dôn*), nonsense.

allzuviel ist ungesund (Ger.), (*äl tsōō fēl'ist oon' gezoont*), too much of a good thing.

al occorrenza (It.), (*ä lō kō ren'zä*), according to circumstances.

à l'ordinaire (*ä lôr dē ner'*), in the ordinary manner.

alose (*ä-lōs'*).—Shad.

à l'outrance (*ä lōō träns'*), to the death.

aloyau (*ȧ-lwä-yō′*).—Loin of beef; short rib of beef.
al piu (It.), (*ȧl pyōō′*), at most.
alto rilievo (It.), (*ȧl tō rē lye′vō*), in high relief.
à main armée (*ȧ mȧN är mä′*), by force of arms.
am Anfang (Ger.), (*ȧm än′fäng*), at the beginning.
amar y saber no puede ser (Sp.), (*ä mär ē sä vär′nō pooäthä sär′*), no one can love and be wise at the same time.
âme de boue (lit., soul of mud), (*äm de bōō*), a base minded person.
amende honorable (*ȧ mȧN dô nô rȧbl′*), fit reparation; a satisfactory apology.
à merveille (*ȧ mer vāy′*), marvelously, extraordinarily.
ami du cour (lit., a friend of the court), (*ȧ mē dü kōōr*), a false friend; one who is not to be depended on.
ami du peuple (*ȧ mē dü pöpl′*), friend of the people.
à moitié (*ȧ mwȧ tēȧ′*), by halves.
Amontillado (*ä-mōn-tēl-yä′dō*).—A cheaper variety of wine classed as sherry, but in reality a wine from Sicily or other Mediterranean or Atlantic islands, mixed with a little real sherry.
amour propre (*ȧ mōōr prōpr′*), vanity, self-love.
ananas (*ä-nä-nä′*).—Pineapple.
anchois (*ȧN-shwä′*).—Anchovies.
anchovy (*an-chō′vi*).—A small fish of the herring family caught in the Mediterranean, and pickled for exportation.
ancienne noblesse (*ȧN sē en nôbles′*), (the old nobility), French families ennobled before the revolution of 1792.
ancien régime (*ȧN sēȧN rā zhēm*), (the former government or administration), the rulers of the ante-revolution period.
andouille (*ȧN-doo′y*).—Tripe.
anguilles (*ȧn-gē′y*).—Eels.
anguilles grillée (*ȧn-gē′y grē-yā′*).—Spitch-cocked, or grilled, eels.
anisette′.—A cordial or liqueur flavored with anise seeds.
à outrance (*ȧ ōō trȧNs′*), to the last extremity.
à pas de géant (*ȧ pȧd zhȧ ȧN*), with a giant's stride.
à peindre (*ȧ pȧNdr′*), worth painting.
à perte de vue (*ȧ pert de vü′*), till out of sight.
à peu près (*ȧ pö pre′*), nearly.
à pezzi (It.), (*ȧ ped′zē*), by the piece.
à piacere (It.), (*ȧ pyȧ′chȧ rā*), at pleasure.
à pied (*ȧ pēȧ′*), on foot.
à plomb (*ȧ plôN′*), perpendicularly; firmly.
à point (*ȧ pwȧN′*), just in time; exactly right.
appui (*ȧ pwē′*), point of support; prop.
à prima vista (It.), (*ȧ prē mȧ vēs′tȧ*), at the first sight.
à prix d'or (*ȧ prē dôr′*), (at price of gold), very costly; fetching a fancy price.
à propos (*ȧ prô pō′*), to the point.
à propos de rien (*ȧ prô pō de rēȧN′*), apropos to nothing not pertinently.
arc-en-ciel (*ȧr kȧN sēel′*), rainbow.
à rez de chaussée (*ȧ rā d shō sȧ′*), even with the ground.
argent comptant (*ȧr zhȧN kôN tȧN′*), ready money.
à rivederci (It.), (*ȧ rē vā där′chē*), adieu until we meet again.
à Rome comme à Rome (*ȧ rôm′ kô mȧ rôm′*), at Rome do as Rome does.
arrière pensée (*ȧ rēer pȧN sā′*), mental reservation; unavowed purpose.
arroz à la Valencia′na (*är-rō′ȧ lȧ*).—Valencia rice, a farinaceous substance in grains like rice.
artichaut (*är-tē-shō*).—Artichoke.
asperge (*ä-spȧrzh′*).—Asparagus.
aspic (*ȧs-pēk′*).—A savory jelly made of calves' feet, etc., or with extract of meat, flavored to suit the fancy, and stiffened with gelatine.
assignat (*ȧ sē nyȧ′*).—French paper money issued after the revolution at the end of last century.
atelier (*ȧt lēȧ′*), a work-shop; studio.
à tort et à travers (*ȧ tôr ā ȧ trȧ ver′*), at random.
à toute outrance (*ȧ tōō tōō trȧNs′*), desperately; tremendously; with a vengeance.
à tout hasard (*ȧ tōō ȧ zär′*), at all hazards; at all events.
à tout prix (*ȧ tōō prē′*), at any price.
attaché (*ȧ tȧsh′*), an official belonging to an embassy.
au (*ō*).—See *à la*.
au beurre roux (*ō bûr roo*).—With browned butter.
au bon droit (*ō bôN drwȧ′*), to the just right.
au bout de son Latin (*ō bōōd sôN lȧ tȧN′*), at the end of his Latin; to the extent of his knowledge.
au chingaras (*ō shȧN-gȧ-rȧ′*).—Sandwiched with ham and grilled; said of ox palates.
au contraire (*ō kôN trer′*), on the contrary.
au courant (*ō kōō rȧN′*), fully acquainted with matters.
au désespoir (*ō dā zes pwär′*), in despair.
au fait (*ō fe′*), expert.
au fond (*ō fôN′*), to the bottom; in the rear (of the stage).
au four (*ō foor*).—Baked in the oven, as a stuffed fish.
au fromage (*ō frō-mäzh′*).—With cheese.
auf Wiedersehen (Ger.), (*owf vē′der zā en*), till we meet again.
au gras (*ō grȧ*).—Containing meat; said of soups so made.
au gratin (*ō grȧ-taN′*).—With a crust made by browning in the oven; as spaghetti is often served *au gratin*.
au jus (*ō zhü*).—In juice; in broth.
au kirsch (*ō kērsh*).—With kirschwasser; as an omelet or a punch containing this liqueur is termed *au kirsch*.
au levant (*ō le vȧN′*), to the east; eastward.
aumelette (*ōm-let′*).—Omelet.
au naturel (*ō nȧ-tü-rel′*).—In the natural condition; as, anchovies *au naturel*—*i. e.*, without oil or seasoning.
au pis aller (*ō pē zȧ lȧ′*), at the very worst.
au reste (*ō rest′*), as for the rest.
au revoir (*ō re vwär′*), till we meet again.
au rhum (*ō rüm*).—With rum.
auro′ra sauce.—Sauce à l'aurore. See *à l'Aurore*.
aussitot dit, aussitot fait (*ō sē tō dē′, ō sē tō fe′*), no sooner said than done.
au supreme (*ō sü-prām′*).—With supreme sauce.
autant d'hommes, autant d'avis (*ō tȧN dôm′, ō tȧN dȧ vē′*), many men, many minds.
auto da fe (Port.), (*ȧ ōō tō dȧ fȧ′*), an act of faith; the burning of Jews and heretics.
autre droit (*ōtre drwȧ′*), another's right.
autre fois (*ōtre fwȧ′*), another time.
autre vie (*ōtre vē′*), another's life.
aut vincere aut mori (*owt vin′kārā owt mō′rē*), victory or death.
au vert pré (*ō vȧr prā*).—With sweet or fresh herbs, especially, when they give a green color to the dish.
au vin blanc (*ō vȧN blȧN′*).—With white-wine sauce, as fillets of fish.
aux (*ō*).—See *à la*.
aux armes (*ō zärm′*), to arms.
aux cressons (*ō kres-sôN′*).—With watercresses.
aux rognons (*ō rō nyôN′*).—With kidneys.
avant-propos (*ȧ vȧN prô pō′*), preface; introductory matter.
avec permission (*ȧ vek per mē sē ôN′*), by consent.
à volonté (*ȧ vô lôN tā′*), at will; at pleasure.
à vostra salute (It.), (*ȧ vōs trȧ sȧ lōō′tā*), to your health.
à votre santé (*ȧ vôtre sȧN tā′*), to your health.
à vuestra salud (Sp.) (*ȧ vwes trȧ sȧ lōōth′*), to your health.

B

bal champêtre (*bȧl shȧN petr′*), a country ball.
ballon d'essai (*bȧ loN de sā′*), a balloon sent up to test the direction of air currents; hence anything said or done to gauge public feeling on any question.
ballotine (*bȧ-lō-tēn′*).—A shoulder of lamb boned, stuffed, larded, and braised.
barbue (*bär-bü′*).—A kind of fish.
bard (*bär*).—Barbel, a kind of fish.
bardes de lard (*bärd de lär*).—Fat slices of bacon for covering meat to be braised.
bar le duc (*bär le dük*).—A kind of jam of white gooseberries.
bas bleu (*bȧ blō′*), a blue-stocking; a woman who seeks a reputation for learning.
Bava′rian cream.—A cream jelly thickened with gelatine and set in a mold, and variously flavored and enriched; a Bavaroise; a kind of flummery.
Bava′rian dumplings.—Boiled pudding, consisting of bread fried in fat, bread crumbs soaked in cream or milk, eggs, butter, flour, salt, and spice; or some other similar composition.
Bava′rian sauce.—A modified Dutch sauce of vinegar, eggs, and butter flavored with crayfish butter.
Bavaroise (*bȧ-vȧ-rwȧz′*).—Bavarian. See *Bavarian cream*.
beau-idéal (*bō ē dā ȧl′*), a model of ideal perfection.
beau monde (*bō môNd′*), the fashionable world.
beaux esprits (*bō zes prē′*), men of wit or genius.
beaux yeux (*bō zēō′*), handsome eyes; attractive looks.
bécasse (*bā-kȧs′*).—Woodcock.
Béchamel (*bā-shä-mel′*), or more properly, **Béchamelle.**—Velouté white sauce mixed with cream; named after Louis de Béchamel, a French gastronome.
beignet (*bā-nyȧ′*).—A fritter.
bel esprit (*be les prē′*), a wit, a genius
bel étage (*be lȧ tȧzh′*), the second story of a house.
belles-lettres (*bel′letr′*), refined literature.
benedetto e quel male che vien solo (It.), (*bā nā det′tō, ā kwȧl mȧ′lā kē vyȧn sō′lō*), blessed is the misfortune that comes alone.
bénédictine (*ben-ē-dik′tin*).—A cordial resembling chartreuse.
ben-trovato (It.), (*bȧn trō vȧ′tō*), well invented.
bête noire (lit. a black beast,) (*bet nwär′*), a bugbear.
beurre (*bûr*).—Butter.
beurre frais (*bûr frȧ*).—Fresh (unsalted) butter.
beurre lié (*bûr lē-ȧ′*).—Dutch sauce with less butter than usual.
beurre noir (*bûr nwär*).—Butter browned without flour.

beurre roux (*bûr roo*).—Butter browned with flour.
bienséance (*bēăN sā ăNs'*), good manners; decorum.
bienvenue (*bēăN ve nü'*), welcome.
bijou (*bē'zhōō*), a jewel; a treasure.
bijouterie (*bē zhōō trē*), jewelry.
billet doux, or **billet d'amour** (*bē ye dōō'*), a love letter.
billets-d'état (*bē ye dā tä'*), a government paper; bank notes.
biscuit (*bē-skwē'*).—French sponge cake.
bis'cuit à couper (*ä koo-pä'*).—A form of sponge cake to be sliced and glacéd with flavored sugar or sugar mixed with fruit juice.
bis'cuit à la Génoise (*ä lä zhā-nwäz'*).—Sponge cake with anise-seed flavor, to be cut and toasted.
bis'cuit à l'Ursuline (*ä lür-sü-lēn'*).—A sponge cake with rice and apple or apricot jam mixed into the paste, and grilled orange flower.
bisque (*bisk* or *bēsk*).—A soup of crayfish, made by cooking them in broth with herbs, sliced roots, and seasoning; other similarly prepared shellfish soups or sauces are also called *bisques*.
bizarre (*be zar*), odd; quaint.
blancmanger (*blăN-maN-zhä'*) or **blamange** (*blä-mänj'*).—A jelly made with calves' feet, or gelatine, and milk of almonds; also, a jelly made of milk and starch, isinglass, or sea moss, with or without added chocolate, grenetine, or the like. This latter dish is more properly called *flummery*.
blanquette (*blăN-ket'*).—A mince of white meat, as of chicken, warmed in velouté sauce, and pointed with butter and lemon juice. It often has added to it mushrooms, morels, or truffles.
blase (*blä zä'*), surfeited.
blond (*blôN*).—Concentrated juice or extract of some viand, used to add to certain sauces to give them body; as *blond de veau* (*de vō*), a rich broth of veal made by slowly stewing veal with accessories of ham, rabbit, or the like, with standard broth, shallots, cloves, etc.
bœuf de chasse (*bûf de shäs*).—The sportsman's round of beef—the biggest joint of the animal.
bombe glacé (*bôNb glä-sä'*).—A confection consisting of an ice casing frozen in the form of a truncaded cone with cream of some kind, as Bavarian cream, inside.
bon ami (*bō na mi'*), good friend.
bon bon (*bôN bôN'*), a sweetmeat; confectionery.
bon diable (*bôN dēăbl'*), a jolly good fellow.
bon grê, mal gré (*bôN'grā mäl'grā*), with good or bad grace; willing or unwilling.
bonhomie (*bô nô mē'*), good nature; easy temper; credulity.
bon jour (*bôN zhōōr'*), good day; good morning.
bon mot (*bôN mō'*), a witticism.
bonne (*bôn*), a nurse.
bonne-bouche (*bôn bōōsh'*), a luscious morsel; a toothsome tit-bit.
bonne et belle (*bô nā bel'*), good and handsome (said of a woman).
bonne foi (*bôn fwä'*), good faith.
bon soir (*bôN swär'*), good evening.
bon ton (*bôN tôN'*), high fashion; first-class society.
bon vivant (*bôN vē väN'*), a good liver; a jolly companion.
bon voyage (*bôN vwä yäzh'*), a pleasant journey.
Bordelaise sauce (*bôr-de-läz'*).—Espagnole sauce with garlic, aromatic herbs, and Bordeaux wine.
boudoir (*bōō dwär'*), a small private apartment.
bouillabasse (*boo-e-yä-bäs'*).—A soup made of fish broiled and seasoned with onion, orange peel, saffron, oil, and other seasoning to suit the taste.
bouilli (*boo-e-yē'*).—Beef stewed, generally in one piece, and served with sauce.
boulettes de brochis (*boo-let' de hä-shē'*).—Forcemeat balls.
bouquet garni (*gär-nē'*).—A tied bunch of parsley, onions, bay leaf, and thyme, used to boil in soup to flavor it.
bourgeoisie (*bōōr zhwa zē'*), the body of citizens; burgess; the shop-keeping class.
bourguignonnes (*boor-gē-nyon'*).—Snails baked with a dressing of shallots, garlic, lemon juice, and butter.
braise (*brāz*), or **brairé** (*brā-zā'*).—A piece of braised meat, or a dish prepared by braising; also a preparation mixed and prepared of various ingredients in or with which dishes are braised.
braisé de Boulanger (*brā-zā' de boo-läN-zhä'*).—A compound sauce in which meat is smothered when being braised.
bretonne sauce (*brä-ton'*).—Espagnole sauce characterized by juice of fried onions or purée of onions.
breveté (*brev tä'*), patented.
Brie cheese, or **Brie** (*brē*).—A soft, white cream cheese.
bris'ket, or **brisquet** (*brē-skä'*).—The breast; the part of the breast next to the ribs.
broccoli (*brok'kō-li*).—A kind of cabbage resembling the cauliflower.
brochet (*brō-shä'*).—Pike; luce—a kind of fish.
brocheton (*brō-she-tôN'*).—Pickerel.
brusquerie (*brüs krē*), rudeness.
brut (*brü*).—An effervescent wine.
bückling (*bük'ling*).—Red herring.
buisson (*bwē-sôN'*).—A dish disposed in a pyramid, and having a prickly appearance.
bureau de la guerre (*bü rō dlä ger'*), the war office.
bur'goo.—Oatmeal porridge.
Burgun'dian sauce.—Espagnole sauce flavored with shallots and red Burgundy wine.

C

cabaretièr (*kä bäre tēä'*), an innkeeper.
cabillaud (*kä-bē-yō'*).—A fresh cod.
cachot (*ka shō'*), a dungeon.
café (*kä-fä'*).—Coffee.
café au lait (*kä-fä' ō lā*).—Coffee with hot milk; coffee to which milk is added during the process of infusion or boiling.
café bavaroise (*kä-fä' bä-vä-rwäz'*).—Coffee with whipped cream.
café noir (*kä-fä'nwär*).—Black coffee; that is, coffee without milk.
café parfait (*kä-fä' pär-fä'*).—A form of coffee ice cream.
café turc (*türk*).—Turkish coffee; that is, coffee prepared by pouring boiling water on very finely ground coffee in the cup.
caille (*käey*).—Quail.
calipash.—A part of a turtle next to the upper shell containing a dull greenish gelatinous substance, esteemed as a delicacy.
calipee.—A part of a turtle attached to the lower shell. It contains a fatty, gelatinous substance of a light yellowish color, esteemed as a delicacy.
camaraderie (*ka ma ra drē*), good fellowship.
Camembert cheese (*kä-măN-bâr'*).—A rich, sweet, cream cheese, of a yellowish color, made in the neighborhood of Camembert, in Normandy, France.
canaille (*kä nä'y*), the lowest class of people; the rabble.
canard (*kä när'*), a false story.
canard (*kä-när'*).—A duck.
canellons (*kä-ne-lôn'*).—Hollow sticks or rolls of baked puff paste.
canelons (*kä-ne-lôN'*).—Rugosities of ox palate, or preparations of them, covered with farce, rolled, and gratinated.
caneton (*kä-ne-tôN*).—Young duck; duckling.
cannelon of meat (*kä-ne-lôN'*).—A baked roll of highly seasoned mincemeat.
cap-à-pié (*kä pä pēä'*), from head to foot.
ca'pers.—The pungent, grayish green flower buds of a trailing shrub (*Capparis spinosa*) of southern Europe.
capilotade of chick'en (*kä-pē-lō-täd'*).—A kind of ragoût made of remains of fowl or game and some simple brown sauce.
ca'pon.—A castrated cock. It fattens better and is tenderer than the uncastrated ones.
carbonari (It.), (*kär bō nä'rē*), members of a secret political society in Italy.
car'dinal sauce.—Velouté variously flavored and colored red, as with cochineal.
carême (*kärem'*), fast; Lent.
carnichons (*kär-nē-shôN'*).—Gherkins.
carré (*kä-rā*).—Breast.
carrelet (*kär-lā'*).—A fish, the sole or flounder.
carte blanche (*kärt blänsh'*), full power.
carte de visite (*kärt de vē zēt'*), visiting card.
cassareep'.—A brown, slightly sweet, aromatic thick extract made from the juice of the manioc.
casserole (*kas'se-rōl;* French pron. *käs-rōl'*).—Stewpan.
cas'serole of rice.—An ornamental pie case made of paste of prepared rice.
cassis (*kä-sēs'*).—Black currants; also, a kind of jelly, and a kind of liqueur or cordial, flavored with black currants.
castello che da orecchia si vuol rendere (It.). (*käs-tel'lō kä dä ō rä'kyä sē vwôl rän dä'rä*), the fortress that parleys soon surrenders.
causerie (*kō-zrē'*), a familiar talk.
caviare (*kä-vē-är'*) or **caviar** (*kav'i-är*).—Roe of sturgeon, and other large fish, prepared and salted, and used as a relish. They often resemble morning-glory seeds in appearance.
champignons (*shäN-pē-nyôN'*).—Mushrooms.
Champs Elysées (*shäN zā lē zā'*), Elysian Fields; a public park in Paris.
cela va sans dire (that goes without saying), (*se la vä säN dēr'*), that is understood.
ce n'est que le premier pas qui coûte (*se ne kle premēä pä'kē kōōt'*), it is only the first step that is difficult.

cèpes (*sāp*), or **ceps** (*sā*).—An edible kind of mushroom.
c'est à dire (*se tà dēr'*), that is to say.
c'est une autre chose (*se tü nō tre shōz'*), that is quite another thing.
chacun à son goût (*shà koN à sôN gōō'*), everyone to his taste.
chacun tire de son côté (*shà kōN tēr' de sôN kō tā'*), every one inclines to his own side or party.
chanson (*shäN sôN'*), a song.
chansons à boire (*shäN sôN zà bwàr'*), drinking songs.
chapeau (*shà pō'*), a hat.
chapeaux bas (*shà pō bà'*), hats off.
chapeau de bras (*shà pō de brà'*), a military cocked hat.
chapelle ardente (*shà pe làr däNt'*), the chamber where a dead body lies in state.
chapon (*shà-pôN'*).—Capon.
chapon au gros sel (*shà-pôN ō grō sel*).—Plain boiled capon; literally, capon served with a big lump of salt (placed upon it).
chargé d'affaires (*shàr zhā dà fer'*), one intrusted with state affairs at a foreign court.
charlotte russe (*shär-lot' rüs*), or **charlotte à la russe** (*shär-lot' à là rüs*).—A dish of custard or whipped cream inclosed in a cup of sponge cake.
chartreuse à la Parisienne (*shär-trûz' à là pà-re-syen'*).—A showy entrée, consisting chiefly of quenelles of forcemeat, containing ragoût and kebobs; an entrée de force; entrée à surprise.
chasse café (*shäs kà-fā'*).—A drink of liqueur served after the coffee at dinner.
château (*shà tō'*), a castle.
châteaux en Espagne (*shà tō zäN nes pàyn'*), castles in Spain.
châteaubriand sauce (*shà-tō-brē-äN'*).—See *maitre d'hôtel butter*.
chauffeur (*shō for'*), driver of an automobile.
chaufroid sauce (*shō-frwà'*).—A white or brown jelly containing some sauce; a sauced jelly, or a gelatinized sauce.
chef (*shef*), man cook.
chef de bataillon (*shef da bà tà yôN'*), a major.
chef-d'œuvre (*shā dö vr'*), a masterpiece.
chemin de fer (lit. iron road), (*she mäNt fer'*), a railway.
chemin faisant (*she mäN fe zäN'*), by the way; in passing.
chère amie (*she rà mē'*), a dear (female) friend, a lover.
cher'vil.—A plant (*Anthriscus cerefolium*) with finely divided leaves. Two curly varieties are used in soups and salads.
che sara, sara (It.), (*ka sà ra sa ra'*), what will be will be.
cheval de bataille (lit., a war-horse), (*she vàl de bà tà'y*) chief dependence or support; one's strong point.
chic (*shēk*), stylish, smart.
chiffonade (*shē-fō-nàd'*).—A salad preparation of lettuce, chervil, sorrel, and scallions, with fresh butter, and some bouillon poured over it. When milk or fresh cream is added, it is called *potage à la chiffonade;* otherwise *potage de santé* (*pō-tàzh' de säN-tā'*).
chil'i.—A kind of red pepper or capsicum.
chil'i sauce.—A sauce condiment made with chilis, tomatoes, etc.
Chinese' stur'geon soup.—A soup of beef and veal, containing pieces of cartilage from the sturgeon's head boiled tender.
chi tace confessa (It.), (*kē tà'chà kōn fes'sà*), he who keeps silent admits his guilt.
chive.—A plant allied to the onion, of which the young leaves are used in omelets, etc.
choucroute (*shoo-kroot'*).—French sauerkraut, or sauerkraut in general.
chou-fleur (*shoo-flûr'*).—Cauliflower.
choux (*shoo*).—(*a*) Cabbages. (*b*) See *choux pâtissières*.
choux de Bruxelles (*shoo de brü-sel'*).—Brussels sprouts.
choux de mer (*shoo de mär*).—Sea kale, a kind of cruciferous pottage root.
choux pâtissières (*shoo pà-tē-syär'*).—Soufflés in small molds; small cakes of baked batter.
ci git (*sē zhē'*), here lies. (A common inscription on tombstones.)
civet (*sē-vā'*).—A ragoût of hare [civet de liévre (*lyā'vr*)], deer [*civet de chevreuil* (*she-vrû'y*)], or other game, into which wine and onions enter as ingredients.
clare'mont sauce.—Butter sauce flavored by frying onions in it. The onions are removed after frying.
cock'a-lee'kie.—Capon soup, boiled with leeks and prunes—a favorite Scotch dish.
cock'tail of oysters or clams.—A dish containing oysters or clams seasoned with ketchup, pepper, etc., and served in a tumbler or glass.
cocotte (*kō-kot'*).—A kind of iron casserole with two loop handles and a cover.
cœurs d'artichauts (*kûr-där-tē-shō'*).—Artichoke heads.
cognac (*kō-nyäk'*).—A brandy distilled at Cognac, in France; hence, loosely, any French brandy.
coiffeur (*kwà-för'*), a hairdresser.
coiffure (*kwà für'*), a headdress.
coing (*kwaN*).—Quince. A liqueur, or ratafia, is made flavored with quince; and a jelly of quinces is called *coing de tranches* (*de träNsh*).
collared.—This term is loosely used with no apparent definite meaning in the names of various dishes.
col'lared beef.—A thin piece of beef, usually from the flank, rolled into a round form.
col'lops.—Small pieces or slices.
com'fit.—A dry sweetmeat; fruit, seed, or the like, preserved in sugar and dried.
comme il faut (*kô mēl fō'*), proper, as it should be.
comment vous portez vous? (*kô mäN vōō pôr tā vōō'*), how are you?
commis voyageur (*kô mē vwà yà zhör'*), a commercial traveler.
compagnon de voyage (*kôN pà nyôN de vwà yàzh'*), a traveling companion.
compiègne cake (*kôN-pyän'*).—A kind of cake intended to be drenched with liqueur, sliced, and sandwiched with apricot jam.
com'pote (French pron. *kôN-pōt'*).—Cooked fruit; fruit preserved with sugar so as to preserve its form. Also, a savory dish of pigeons, quails or larks, mixed with peas or mushrooms.
compte rendu (*kôNt räN dü'*), an account rendered, a report.
comptoir (*kôN twàr'*), a counting-house; a counter.
comte (*kôNt*), count.
comtesse (*kôN tes'*), countess.
con amore (It.), (*kō nà mō'rà*), with affection, very earnestly.
concierge (*kôN s erzh'*), a door-keeper.
conciergerie (*kôN sē er zhrē'*), a door-keeper's lodge; a noted prison in Paris.
concours (*kôN kōōr'*), competition for, or as for, a prize.
con diligenza (It.), (*kōn dē lē dshen'dzà*), with diligence.
con dolore (It.), (*kōn dō lō'rà*), with grief; sadly.
confit (*kôN-fē'*).—A dry sweetmeat; fruit preserved in sugar and dried; a comfit.
confiture (*kôN-fē-tür'*).—Preserves.
confrère (*kôN frer'*), a colleague.
conoscente (It.), (*kō nō shen'tà*), a connoisseur.
conseil de famille (*kôN se'y de fà mē'y*), a family council or consultation.
conseil d'état (*kôN se'y dà tà'*), a council of state; a privy council.
consommé (*kôN-sō-mà'*).—Strong broth of meat and vegetables, concentrated till slightly browned; in restaurants applied to thin soups such as would be made by this broth diluted.
cor'dial.—A sweet and aromatic liquor. A *liqueur* is an alcoholic cordial.
contretemps (*kôn tre täN'*), an awkward mishap.
cordon sanitaire (*kôr dôN sà nē ter'*), a line of sentries to prevent, as far as possible, the spread of contagion or pestilence. Used also of other precautionary measures.
corps diplomatique (*kor dē plô mà tēk'*), a diplomatic body.
cortège (*kor tezh*), a procession.
côte (*kōt*).—A rib.
côtelette (*kōt-let'*).—A small rib; part of a rib; a piece of meat with the rib attached; a cutlet.
couleur de rose (*kōō lör de rōz'*), rose color.
coup (*kōō*), a stroke.
coup de grâce (*kōō d grās'*), a finishing-stroke. (Formerly applied to the fatal blow by which the executioner put an end to the torments of a culprit broken on the wheel.)
coup de main (*kōō d mäN'*), a sudden attack, enterprise, or undertaking.
coup de maître (*kōō d metr'*), a master-stroke; with consummate skill.
coup de pied (*kōō d pēà'*), a kick.
coup de plume (*kōō d plüm'*), a literary attack.
coup de soleil (*kōō d sô le'y*), a sunstroke.
coup d'essai (*kōō de sà'*), a first attempt.
coup d'état (*kōō dà tà'*), a stroke of policy; a sudden and decisive blow, usually inflicted by unconstitutional means.
coup de théâtre (*kōō dà tà ätr'*), a theatrical effect.
coup d'œil (*kōō dö'y*), a rapid glance.
courage sans peur (*kōōràzh säN pör*) fearless courage.
court bouillon (*boo-e-yôN'*).—A very rich bouillon made by braising bouillon vegetables in butter, evaporating down, and then boiling in wine. It is added to sauces.
coute qu'il coute (*kōōt kēl kōōt'*), cost what it may.
crême (*krām*, or *krâm*).—A cordial of the relatively thick or visced kind, such as *crême* de la menth (cream of minth), *crême* de la moka (cream of mocha coffee), *crême* de cocoa (cream of cocoa), etc.

crême bachique (*krām bâ-shēk'*).—A custard jelly with wine and egg-froth.
crême brulée (*krām brū-lā'*).—Brown sugar, or caramel, with cream.
crême fouettée à la paysanne (*foo-et-ta' ā lā pā-zān'*). Whipped cream.
créole (*krā-ōl'*).—See *à la creole.*
crêpes (*krāp*).—Small fried cakes; a form of French pancake.
cressons (*krā-sôn'*).—Cresses.
crève-cœur (*krev kŏr'*), deep sorrow; grief.
crevette (*krā-vet'*).—Shrimp.
croquants *krō-kăn'*).—A piece of crisp pastry or confection which makes a crunching sound between the teeth, as a macaroon or a nougat.
crouton (*kroo-tôn'*).—Small pieces of bread fried in butter or oil, for use as a garnish to salmis, fricassees, etc., or to serve with soups.
croquembouches (*krō-kăn-boosh'*).—Small mounted pieces of crisp pastry, such as macaroons, nougats, gimblettes, etc.
crum'pet.—A kind of large, thin, light cake or muffin cooked on a griddle.
cuisine (*küē zēn'*), a kitchen; cookery.
cuissot (*kwē-sō'*).—Haunch.
cul-de-sac (*kül de săk'*), the bottom of the bag; a blind alley.
cyg'net.—A young swan.

D

d'accord (*dȧ kôr'*), agreed; in tune.
dame d'honneur (*dām dô nŏr'*), a maid of honor.
dantesques (*dăn-tesk'*).—Frozen custards.
dariole (*dă-rē-ōl'*).—A piece of pastry consisting of a shallow cup of short paste, filled with a rich compound of cream or custard with macaroons, fruit, or the like.
darne (*därn*).—Slice; cut.
das geht Sie nichts an (Ger.), (*däs gāt zē nikts ăn'*), that does not concern you.
de (*de*).—Of.
de bonne augure (*de bô nō gür'*), of good omen.
de bonne grâce (*de bôn gräs'*), with good will, willingly.
débris (*dā brē'*), refuse.
début (*dā bü'*), first appearance.
débutante (*dā bü tăn't'*), a young lady just entering society.
décolleté (*dā kôl tā'*), open-breasted.
dégagé (*dā gȧ zhā*), free, easy, without constraint.
de gaieté de cœur (*de gā tā d kŏr'*), in sport, sportively.
de haute lutte (*de ōt lüt'*), by a violent struggle.
dehors (*dā ôr'*), without; out of; foreign; irrelevant.
déjeuner à la fourchette (*dā zhō nā ȧ lȧ fōor shet'*), a cold breakfast.
de mal en pis (*de mȧ lăn pē'*), from bad to worse.
demeure (*de mŏr'*), dwelling; residence.
demi-jour (*de mē zhōor'*), faint light.
demi-tasse (*dā-mē-tăs'*).—A small cup for black coffee.
dénouement (*dā nōō măn'*), an unraveling or winding up.
dépêche (*dā pesh'*), a dispatch; a message.
dernier cri (*der nēā krē'*), (the latest cry), the latest fashionable fad.
dernier ressort (*der nēā re sôr'*), the last resource.
désagrément (*dā zȧ grā măn'*), something disagreeable or unpleasant.
désorienté (*dā zô rēăn tā'*), confused.
désossée (*dā-sō-sā'*).—Boned.
détour (*dā tōor'*), a circuitous march.
de trop (*de trô'*), too much or too many; not wanted.
devoir (*de vwär'*), duty.
diablotins (*dē-ab-lō-tan'*).—(*a*) Frozen custards. (*b*) Neapolitan dragées. (*c*) Chocolate bonbons in paper.
di buona volonta sta pieno l'inferno (It.), (*dē bwô nȧ vō lōn'tȧ sta pyā'nō lēn fer'nō*), hell is full of good intentions.
Dieu est toujours pour les plus gros bataillons (*dēō e tōō zhōor' pōor lā plü grō bȧ tȧ yôn'*), God is always on the side of the largest battalions; the largest army has the best chance.
Dieu et mon droit (*dēō ā môn drwä'*), God and my right.
Dieu vous garde (*dēō vōō gȧrd'*), God protect you.
di grado en grado (It.), (*dē grä'dō ān grä'dō*), step by step gradually.
dinde (*dăND*).—Turkey.
dindonneau (*dăn-dō-nō'*).—Young turkey; turkey pout.
Dios me libre de hombre de un libro (Sp.), *dē'ōs mā lē'vrā dā ōm'vrā dā ōōn lē vrō*), God deliver me from a man of one book.
di salto (It.), (*dē säl'tō*), by leaps.
di tutti novello par bello (It.), (*dē tōōt tē nō vel'lo pär bel'lō*), everything new seems beautiful.
divertissement (*dē ver tēs măn'*), amusement; sport.
di zara (*dē zä'rȧ*).—A less common name for maraschino.
doctrinaire (*dȯk trē ner'*), a theorist.
dolce far niente (It.), (*dōl'chā fär nyen'tā*), sweet idleness.
domino (It.), (*dō'mē nō*), a mask robe.
dorer la pilule (*dō rā lȧ pē lül'*), to gild the pill.
double entente (*dōō blăn tăn't'*), double meaning; a play on words.
douceur (*dōō sor'*), a bribe.
doux yeux (*dōō zēō'*), soft glances.
drap d'argent (*drȧ dȧr zhăn*), silver lace.
drap d'or (*drȧ dôr'*), gold lace.
droit des gens (*drwä dā zhăn'*), the law of nations; international law.
drôle (*drōl*), droll; funny.
drôle le corps (*drōl le kôr'*), a droll fellow; a punster.
durante vita (Sp.), (*dōō rān'tā vē'tȧ*), during life.
Dutch sauce.—Butter emulged with yolk of egg, or a sauce with this as a basis; Hollandaise sauce.

E

eau de cologne (*ō d kô lôn'y*), Cologne water.
eau de vie (*ō d vē'*), the water of life—applied usually to brandy.
ébauche (*ā bōsh'*), a rough drawing; a sketch.
éclanche (*ā klănsh'*).—Shoulder of mutton.
éclat (*ā klȧ'*), splendor; brilliancy.
école de droit (*ā kôl de drwȧ'*), law school.
école de médecine (*ā kôl de mād sēn'*), medical school.
école militaire (*ā kôl mē lē ter'*), military school.
école polytechnique (*ā kôl pô lē tek nēk'*), polytechnique school.
écrevisse (*ā-kr-vēs'*).—Crayfish.
édition de luxe (*ā dē sēōn' de lüks'*), a splendid edition of a book, handsomely bound, and usually well illustrated.
égal (*ā gȧl'*), equal.
égalité (*ā gȧ lē tā'*), equality.
égarement (*ā gär măn'*), bewilderment.
ehrlich währt am längsten (Ger.), (*ār'lik vert ăm leng'sten*), honesty is the best policy.
eile mit Weile (Ger.), (*ī le mit vī'le*), the more haste, the less speed.
eine Schwalbe macht keinen Sommer (Ger.), (*ī ne shwäl'be mäkt kī nen zō'mer*), one swallow does not make a summer.
ein gebranntes Kind scheut das Feuer (Ger.), (*īn ge brăn tes kint' zhôit dās fôi'er*), a burnt child dreads the fire.
el corazon manda las carnes (Sp.), (*āl kō rā thōn' māndȧ lās kär'nās*), the heart bears up the body.
élève (*ā lev'*), pupil.
élite (*ā lēt'*), a select body of persons.
éloge (*ā lōzh'*), a funeral oration.
éloignement (*ā lwȧn ye măn*), estrangement.
embonpoint (*ăn bôn pwan'*), roundness, good condition.
émigré (*ā mē grā'*), an emigrant.
employé (*ăn plwȧ yā'*), a person employed; a clerk.
empotage (*ăn-pō-tăzh'*).—Consommé or gravy broth.
empressement (*ăn pres măn'*), ardor; zeal; interest.
en ami (*ăn nȧ mē'*), a friend.
en arrière (*ăn nȧ rē er'*), in the rear; behind.
en attendant (*ăn nȧ tăn dăn'*), in the meantime.
en avant (*ăn nȧ vȧn'*), forward.
en badinant (*ăn bȧ dē năn'*), in sport, jestingly.
en bagatelle (*ăn bȧ gȧ tel'*), trifling; contemptuously.
en ballon (*ăn bä-lôn'*).—Boned and stuffed with forcemeat, etc.—said of fowls' legs so cooked.
en bloc (*ăn blôk'*), in the lump.
en brochette (*ăn brō-shet'*).—On wooden skewers.
en caneton (*ăn kä-ne-tôn'*).—A term used to designate fowls' legs boned and stuffed with forcemeat, etc.
en casserole (*ăn kȧ-s-rōl'*).—In a casserole.
en coquille (*ăn kō-kē'y*).—(Served) in shells, as oysters prepared as if to be escalloped and then baked in shells and served.
en cracovie (*ăn krä-kō-vē'*).—With salpicon wrapped in calf's udder or pig's caul—said of ox palates.
en cueros, en cueros vivos (Sp.), (*ān kōōā'rōs, ān kōōā'rōs vē vōs*), naked; without clothing.
ende gut, alles gut (Ger.), (*en'de gōōt, ä'les gōōt*), all's well that ends well.
en déshabillé (*ăn dā zȧ bē yā*), in undress; in one's true colors.
en Dieu est me fiance (*ăn dēō'e mȧ fēăns'*), my trust is in God.
en Dieu est tout (*ăn dēō e tōō'*), in God are all things.
en échelon (*ăn nā sh lôn'*), in steps; like stairs.
en effet (*ăn ne fe'*), substantially, really, in effect.
en famille (*ăn fȧ mē'y*), with one's family at home.
enfant gâté (*ăn fän gȧ tā'*), a spoiled child.
enfants perdus (lit., lost children), (*ăn fän per dü'*), a forlorn hope.

enfant terrible (*äN fäN te rēbl'*), (a terrible child), one that is apt to do or say something exceedingly ill-timed and embarrassing.
enfant trouvé (*äN fäN trōō vā'*), a foundling.
enfin (*äN fäN'*), in short, finally, at last.
en flute (*äN flüt'*), carrying guns on the upper deck only.
en foule (*äN fōōl'*), in a crowd.
en grand (*äN gräN'*), of full size.
en grande tenue (*äN grände te nü'*), in full official, or evening, dress.
en grande toilette (*äN grände twä let'*), full-dressed; in full rig.
en haut (*äN ō'*), on high; above.
en masse (*äN mäs'*), in a body or mass.
ennui (*äN nüē'*), weariness.
en passant (*äN pä säN'*), in passing, by the way.
en plein jour (*äN pläN zhōōr*), in open day.
en queue (*äN ko'*), immediately after; in the rear. Used specially of persons waiting in line, as at the door of a theater, at the ticket-office of a railway station, etc.
en rapport (*äN rä pôr'*), in harmony, relation, or agreement.
en règle (*äN regl'*), regular; regularly; in order.
en revanche (*äN re väN sh'*), in return; as a compensation for.
en route (*äN rōōt*), on the way.
ensemble (*äN säN bl'*), the whole.
en suite (*äN süēt'*), in company; in a set.
en tasse (*äN täs'*), in a cup.
entente cordiale (*äN täNt kôr dēäl'*), a good understanding, especially between two states.
entourage (*äN tōō räzh'*), surroundings.
en tout (*äN tōō'*), in all; wholly.
entre deux feux (*äN tre dö fö'*), between two fires.
entre deux vins (lit., between two wines), (*äN tre dö vän'*), half-drunk.
entre nous (*äN tre nōō'*), between ourselves; in confidence.
entrepot (*äN tre pō'*), a warehouse or magazine.
entreprenant (*äN tre pre nän'*), enterprising.
entrepreneur (*äN tre pre nör'*), a contractor; the chief director of an undertaking.
entre-sol (*äN tre sôl'*), a half story or mezzanine, especially one next above the ground floor.
en vérité (*äN vā rē tā'*), in truth; really.
en vigueur (*äN vē gör'*), in force.
envoyé (*äN vwä yä'*), an envoy or messenger.
escargots (*äs-kär-gō'*).—Snails.
escarole (*es-kä-rōl'*).—A species of chicory used for salads; also, a variety of lettuce resembling this.
es fehlt mir nichts (Ger.), (*es fält mēr nikts'*), nothing is the matter with me.
es freut mich sehr (Ger.), (*es frôit mik zār'*), I am very glad.
es ist nicht alles Gold, was glänzt (Ger.), (*es ist nikt ä les gôlt' väs glentst'*), all is not gold that glitters.
espagnol, (*es pä nyōl'*), Spanish; a Spaniard.
espagnole sauce (*es-pä-nyōl'*).—Brown sauce made by boiling meat and flavoring vegetables and spices in normal broth to a glace, browning with roux, and removing the fat.
esprit de corps (*es prē d kôr'*), the spirit of honor, loyalty, or enthusiasm in an individual working for the good of a common body, society, or association, as a college class, a military company, fraternal or other association.
esprit des lois (*es prē dä lwä'*), spirit of the laws.
es thut mir sehr leid (Ger.), (*es tōōt mēr zār lit'*), I am very sorry.
esturgeon (*es-tür-zhôN'*).—Sturgeon.
Etats-Généraux (*ā tä zhä nä rō'*), the States-General.
Ewigkeit (Ger.), (*ä'vik kit*), eternity.
exposé (*ek spō zā'*), an exposition; a recital.

F

façon de parler (*fä sôN de pär lā'*), manner of speaking; phrase; locution.
fade (*fäd*), flat; stale; insipid.
fainéant (*fe nä äN'*), idle.
faire bonne mine (*fer bôn mēn'*), to put a good face on the matter.
faire l'homme d'importance (*fer lôm däN pôr täNs'*), to give one's self airs.
faire sans dire (*fer säN dēr'*), to act without ostentation or boasting.
faire son devoir (*fer sôN de vwär'*), to do one's duty.
faisan (*fä-säN'*).—Pheasant.
fait accompli (*fe tä kôN plē'*), a thing accomplished; an accomplished fact.
fanchonettes (*fäN-shō-net'*).—Small cakes like tartlets covered with meringue froth, with jam, currants, etc.
farcie (*fär-sē'*).—Stuffing of forcemeat.
farine de riz (*fä-rēn' de rē'*).—Rice flour.
faubourg (*fō bōōr'*), an outskirt of a town; a suburb.
fausse tortue (*fōs tôr-tü*).—Mock turtle.
fauteuil (*fō tö'y*), an easy chair.
faux pas (*fō pä'*), a false step; an act of indiscretion.
fécule de pommes de terre (*fä-kül' de pum de tär'*).—Potato starch, used especially in making Savoy cakes, and others.
femme couverte (*fäm kōō vert*), a married woman.
femme de chambre (*fäm de shäNbr'*), a chambermaid.
femme de charge (*fäm de shärzh*), a housekeeper.
femme galante (*fäm gä läNt'*), a gay woman; a prostitute.
femme sole (*fäm sōl'*), an unmarried woman.
fendre un cheveu en quatre (*fäN drōN she vö äN kätr'*), to split a hair in four; to make subtle distinctions.
fête (*fet*), a feast; festival; holiday.
fête champêtre (*fet shäN petr'*), a rural out-of-door feast; a festival in the fields.
fête Dieu (*fet dēö'*), the Corpus Christi festival in the Roman Catholic church.
feu de joie (*fö d zhwä*), a bonfire; a firing of guns in token of joy.
feuilletage (*fö-ye-täzh'*).—Puff paste.
feuilleton (*fö y tôN'*), a small leaf; a part of a newspaper devoted to light, entertaining matter.
filet (*fē-lä'*), Eng. **fil'let.**—(*a*) The under cut of the loin of beef and venison. (*b*) Breast of fowl or game when cut out [the inner muscles near the bone being the filet mignons (*fē-lā' mē-nyôN'*)]. (*c*) Any longish strips of meat or vegetables.
filet du dedans (*fē-lā' dü dä-däN'*).—The under cut of the loin of beef; a filet.
fille de chambre (*fē y de shäN br'*), a chambermaid.
fille d'honneur (*fē y dö nör'*), a maid of honor.
fil'let.—See *filet.* Fillet is the usual spelling in English culinary books.
fils (*fēs*), son.
fin de siècle (*fäN d sēekl'*), the end of the century.
Fin'nan had'die.—Haddock cured in peat smoke, originally coming from Findon (pronounced *fin'an*) in Scotland; also, haddock smoked in other ways.
flageolets (*flä-zhō-lä'*).—Beans.
flamms.—Pancakes.
fleur-de-lis (*flör de lē'*), the flower of the lily.
fleur de terre (*flör de ter*), even with the surface of the ground.
fleurons (*flü-rôN'*).—Punched-out ornaments of bread (crusted or fried), or of paste (baked), or of other materials.
Flor'ence cakes, or **Flor'entines.**—A kind of cake consisting of a thin shell of puff paste containing a composition of curds, butter, yolks, flour, bitter almonds, and lemon, or a very similar composition.
flum'mery.—A cold, sweet dish chiefly of cereals, often with fruit in it, molded and to be eaten with wine, milk, or sauce.
foie (*fwä*).—Liver.
flux de bouche (*flüks de bōōsh'*), inordinate flow of talk; garrulity.
fond (*fôN*).—The broth or juice from braised flesh or fish, usually served as a sauce.
fondue (*fôN-dü'*).—A preparation of cheese, eggs, and butter melted together.
fra (It.), (*frä*), brother; friar.
frais (*fre*), cost; expense.
fraise (*frāz*).—Strawberry.
framboise (*fräN-bwäz'*).—Raspberries.
Fra Modesto non fu mai priore (It.), (*frä mō des tō nōn fōō mä ē pryö'rā*). Friar Modest never became prior.
franco (It.), (*fräng'kō*), free from postage.
frangipane (French pron. *fräN-zhē-pän'*).—A kind of compound pastry cream flavored with almonds, with which pastry is garnished.
frisch begonnen, halb gewonnen (Ger.), (*frish be gō'nen, hälp ge vō'nen*), well begun is half done.
froides mains, chaude amour (*frwäd mäN' shō dä mōōr'*), cold hands, warm heart.
fromage (*frō-mäzh'*).—Cheese.
fromage à la Chantilly (*ä lä shäN-tē-yē'*).—**fromage de Chantilly** (*de shäN-tē-yē'*).—Apricot jam.
frondeur (*frôN dör'*), a declaimer against the existing administration.
front a front (*frôN tä frôN'*), face to face.
fru'menty.—A food prepared by boiling wheat in milk to a jelly, usually with the addition of currants, sugar, egg yolk, and spice.
fumet (*fü-mä'*).—A high-flavored substance, such as extract of game, for flavoring dishes of food; also, less properly, a ragoût of partridge and rabbits braised in wine.
fuyez les dangers de loisir (*füē yä lä däN zhäd lwäzēr'*), fly from the dangers of leisure.

G

galeté de cœur (*gā tā d kōr′*), gaiety of heart.
galatine.—Boned fowl, veal, or the like, stuffed with pieces of meat and force, boiled, and served cold, with a garnish of jelly or aspic.
gal′imaufry, or **gallimafrée** (*gä-lē-mä-frā′*).—A kind of ragoût of various kinds of meat highly flavored.
garage (*gä räzh′*), a place where automobiles are stored and kept in order.
garbancas (*gär-bän-säs′*).—Chick-peas.
garbure (*gär-bür′*).—A soup of bacon and cabbage or other vegetables sometimes with cheese added.
garçon (*gär sôn′*), a lad; a waiter.
garde à cheval (*gär dä she väl′*), a mounted guard.
garde du corps (*gärd dü kôr′*), a bodyguard.
garde mobile (*gärd mô bēl′*), a body of troops liable to be called out for general service.
garde royale (*gärd rwä yäl′*), royal guard.
gardez (*gär dā′*), take care; be on your guard.
gardez-bien (*gär dā bēäN′*), take good care; be very careful.
gardez la foi (*gär dā lä fwä′*), keep the faith.
Gas′cony sauce.—Velouté with capers, truffles, and egg yolk.
gaspacho (*gäs-pä′chō*).—A bread-and-vegetable salad, made by the Spanish, containing pimentoes, tomatoes, oil, and vinegar, and (in the richer form) fish, crayfish, piquant preserves, etc.
gâteau (*gä tō′*), cake.
gâteaux (*gä-tō′*).—Cakes of flour, butter and eggs.
gâteaux de puits d'amour (*de pwē dä-mōōr′*).—Lovewells.
gaucherie (*gōsh rē′*), awkwardness.
gauffres (*gō′fr*).—Waffles.
gehen Sie Ihres weges (Ger.), (*gā′en zē ē res vā′ges*), go your way.
gelée (*zhe-lā′*).—Jelly.
gendarmerie (*zhäN där me rē′*), the armed police force.
Gene′va sauce.—A coulis of fried onions with meat essence or espagnole, with anchovy butter, and usually port or claret wine. It is used especially with fresh water fish.
génoise sauce (*zhā-nwäz′*).—Espagnole sauce flavored with fumet and red wine.
génoises (*zhā-nwäz′*).—Glazed cakes of sugar, eggs, flour and almonds.
gens d'armes (*shäN därm′*), men-at-arms; military police.
gens de condition (*zhäN de kôN dē sēôN′*), people of rank.
gens d'église (*zhäN dā glēz′*), the clergy; clerics.
gens de guerre (*zhäN d ger′*), military men.
gens de lettres (*zhäN d letr′*), literary men.
gens de loi (*zhäN d lwä′*), lawyers.
gens de même famille (*zhäN d mem fä mē′y*), people of the same family; birds of a feather.
gens de peu (*zhäN d pö′*), the lower classes.
gentilhomme (*zhäN tē yôm′*), a gentleman.
gibelotte (*zhē-blot′*).—Stewed rabbit; sometimes, stewed chicken or other white meat.
gibier (*zhē-byā′*).—Game, as hare, deer, etc.
givier de potence (*zhē bēā d pô täNs′*), a gallows-bird; one who deserves hanging.
gigot (*zhē-gō′*).—Leg of mutton.
gimblettes (*zhäN-blet′*).—Small pastry preparations, such as croquignoles and croquembouches. Small pastry, or patés de petit four; they are used as ingredients of croquembouches.
giovine Italia (It.), (*dzhō vē′nā ē tä′lyä*), young Italy.
giovine santo, diavolo vecchio (It.), (*dzhō vē nä säN′tō dyä′vō lō vek′kyō*), a young saint; an old devil.
gitano (Sp.), (*hē tä′nō*), a girl.
glace (*gläs*).—A glaze, or broth, reduced by boiling to a gelatinous paste, so that when poured over meats it will give them a shiny appearance.
glacé (*glä-sā′*).—Covered with glace.
glaced (*gläst*).—Iced; having a shiny appearance produced by a coating of sugar, gelatine, or glace.
glaize, or **glase** (*glāz*).—A glace.
gleich und gleich gesellt sich gern (Ger.), (*glīk′ oont glīk′ ge zelt sik gern′*), birds of a feather flock together.
gli assenti hanno torti (It.), (*lyē äs sen′tē än nō tôr′tē*), the absent are in the wrong.
godiveau (*gō-dē-vō′*).—A kind of mincemeat, usually of veal, made into balls, to garnish the interior of hot patés and vol-au-vents.
gold′en buck.—A Welsh rarebit served with a poached egg on it.
goujon (*goo-zhôN′*).—Gudgeon, a rather coarse fish.
goulash (*goo-läsh′*).—See *gulash*.
goutte à goutte (*gōō tä gōō′*), drop by drop.
gouvernante (*gōō ver näNt′*), governess.
grâce à Dieu (*gräs ä dēö′*), thanks be to God.
grande chère et beau feu (*gräNd sher′ ā bō fö′*), good fare and a good fire; comfortable quarters.
grande parure (*gräNd pä rür′*), full dress.
grande toilette (*gräNd twä let′*), full dress.
grand merci (*gräN mer sē′*), many thanks.
gratin (*grä-taN′*).—The brown crust formed upon a gratinated dish; also, the dish itself.
grat′inate.—To cook, as macaroni, in a savory sauce or broth until the juice is absorbed and a brown crust forms.
gren′adine.—A kind of fricandeau, with a basis of forcemeat.
grenouille (*gre-noo′y*).—Frog.
grill.—To broil.
grenadin (*grä-nä-daN′*).—A small fricandeau, or dish made with a basis of forcemeat.
grisette (*grē zet′*), dressed in gray. (Applied to French shop girls.)
groseille à maquereau (*grō-zā′y ä mä-k′rō′*).—Gooseberry.
gros rôti (*grō rō-tē′*).—A large joint of roast meat.
grosse tête et peu de sens (*grōs tet′ ā pö d säNs′*), a big head and little sense.
Gruyère cheese (*grü-yär′*).—A kind of salted cheese in thin cakes.
guava jel′ly (*gwä′vä*).—An excellent jelly made from the slightly astringent fruit of either of two tropical trees.
guerra al chuchillo (Sp.), (*gā′rä äl kōō chē′lō*), war to the knife.
guerra cominciata, inferno scatenato (It.), (*gwe ra kō mēn chyä′tä, ēn fär′nō skatän′tä*), war begun; hell unchained.
guerre à mort (*ge rä môr′*), war to the death.
guerre à outrance (*ge rä ōō träNs′*), war to the uttermost.
gulash (*goo-läsh′*), or **Hunga′rian gulash.**—A ragoût of rump steak flavored with paprika.
gum′bo.—A soup thickened with the mucilaginous pods of the okra; also, the okra pods themselves.

H

habitué (*ä bē tüā′*), a frequenter.
hardiesse (*är dēes′*), boldness.
hareng (*ä-räN′*).—Herring.
haricot (*ä-rē-kō′*).—A stew or ragoût of meat. Also, the common string bean.
haricots verts (*ä-rē-kō′ vär*).—Green string beans.
haut et bon (*ō tā bôN*), great and good.
haut gout (*ō gōō′*), high favor; elegant taste.
hauteur (*ō tör′*), haughtiness and pride.
haut ton (*ō tôN′*), highest fashion.
heureusement (*ö röz mäN′*), happily.
historiette (*ēs tô rēet′*), a short history; a tale.
Hollandaise sauce (*ō-läN-dāz′;* Eng. pron. *hol′lan-dāz′*). See *Dutch sauce*.
homard (*ō-mär′*).—The European lobster—larger than the American lobster, called *homard américaine* (*ō-mär′dä-mä-rē-kän′*).
homme d'affaires (*ôm dä fer′*), a man of affairs.
homme d'état (*ôm dä tä′*), a statesman.
homme de robe (*ôm de rôb′*), a man in civil office.
homme de lettres (*ôm de letr′*), a literary man.
homme d'esprit (*ôm des prē′*), a man of intellect.
honi soit qui mal y pense (*ō ne swä′ kē mäl ē päNs′*), shame be to him who thinks evil of it. (The motto of the Order of the Garter.)
hors de combat (*ôr de kôN bä′*), disabled; unfit to continue a contest.
hors de la loi (*ôr de lä lwä*), outlawed.
hors de propos (*ôr de prô po′*), wide of the point; inapplicable.
hors de saison (*ôr de se zôN′*), out of season; unseasonable.
hors d'œuvre (*ôr dövr′*), out of course; out of accustomed place. (Used substantively of small appetizing dishes served between the soup and the second course.)
hôtel des invalides (*ō tel dā zäN vä lēd′*), hospital for old and disabled soldiers.
hôtel de ville (*ō tel de vēl′*), a town hall.
hôtel Dieu (*ō tel dēö′*), a house of God; a hospital.
hôtel garni (*ō tel gär nē′*), furnished lodgings.
huîtres (*wē′tr′*).—Oysters.
huîtres au lit (*ō lē*).—Same as pigs in blankets.
hure de sanglier (*ür de säN-glyā′*).—Head of wild boar.
hurtar para das por Dios (Sp.), (*ōōr tär′ pä rä där pōr dē′ōs*), to stea in order to give to God.

I

ich diene (Ger.), (*ik dēne*), I serve.
idée fixe (*ē dā fēks′*), a fixed idea; intellectual monomania.
ignorance crasse (*ī nyô räns′ krās′*), gross ignorance.

i gran dolori sono multi (It.), (*ē grän dō lō'rē sō nō mōōl'tē*), great griefs are silent.
il a le diable au corps (*ē là l dēäblō kôr'*), the devil is in him.
il faut de l'argent (*ēl fō d làr zhäN*), money is wanting.
il n'a ni bouche ni éperon (*ēl nà nē bōōsh nē ā prôN'*), he has neither mouth nor spur; he has neither wit nor courage.
il ne faut jamais défier un fou (*ēl ne fō zhà me' dāfēä ōN fōō*), one should never provoke a fool.
il n'est sauce que d'appétit (*ēl ne sōs ke dà pā tē'*), hunger is the best sauce.
il penseroso (It.), (*ēl pān sā rō'sō*), the pensive man. (The title of one of Milton's poems.)
il sent le fagot (*ēl säN le fà gō'*), he smells of the faggot; he is suspected of heresy.
impoli (*äN pô lē'*), unpolished; rude.
impolitesse (*äN pô lē tes'*), coarseness; rudeness.
impromptu (*äN prôNp tü'*), a prompt remark without study.
in blanco (It.), (*ēn byäng'kō*), in blank; in white.
in petto (It.), (*ēn pet'to*), within the breast; in reserve.
insouciance (*äN sōō sēäNs'*), indifference; carelessness.
in un giorno non si fe 'Roma (It.), (*ēn ōōn dzhōr'nō nōn sē fā rō'mä*), Rome was not built in a day.
ir por lana, y volver trasquilado (Sp.), (*ēr pōr là'nä, ē vōl vär' trās kē là'thō*), to go for wool and come back shorn.

J

jalousie (*zhà lōō zē'*), jealousy; a Venetian window blind.
jambon (*zhän-bôN'*).—Ham.
jamais bon coureur ne fut pris (*zhà me' bôN kōō rōr' ne fü prē'*), a good runner is not to be taken; old birds are not to be caught with chaff.
Jardin des Plantes (*zhàr dàN dā plänt'*), the botanical garden in Paris.
jardinière (*zhär-dē-nyär'*).—A dish cooked à la jardinière. See *à la jardinière*. Jardinière soup has as many roots and green vegetables as can be; it differs from julienne soup by the prevalence of green vegetables in it.
je maintiendrai le droit (*zhe mäN tēäN drā le drwä'*), I will maintain the right.
je ne sais quoi (*zhe ne se kwä'*), I know not what.
je n'oublierai jamais (*zhe nōō blē zā zhà me'*), I will never forget.
je suis prêt (*zhe süē pre'*), I am ready.
jet d'eau (*zhe dō'*), a fountain; a jet of water.
jeu de mots (*zhō d mō'*), a play upon words; a pun.
jeu d'esprit (*zhō des prē'*), a witticism.
jeu de théâtre (*zhō d tā ätr'*), a stage trick; clap-trap.
jeunesse dorée (*zhō nes dō rā'*), the gilded youth.
je vis en espoir (*zhe vē zäN nes pwär'*), I live in hope.
joli (*zhô lē*), pretty; attractive.
julienne soup (*zhü-lyen'*).—Soup à la julienne. See *à la julienne*.
jus (*zhü*).—Broth; soup juice; gravy.
juste-milieu (*zhüst mē lēō'*), the exact middle; the golden mean; the middle course is the safest.

K

kein Kreuzer, kein Schweizer (Ger.), (*kīn krôi'tser, kīn shwī'tser*), no money no Swiss.
kip'pered her'ring.—A herring split, salted, and smoked.
kirshwasser (*kērsh-väs'ûr*).—A cordial distilled from the juice of the small black cherry.
klöse (*klû'ze*).—Dumplings.
kumiss (*koo'mis*), or **kumys.**—A beverage consisting of a liquor made by fermenting milk, originally mare's or camel's milk.
kummel (*koom'mel*).—A liqueur made in Germany and Russia flavored with cumin, caraway, or fennel.

L

lâche (*läsh*), lax; relaxed.
la critique est aisée, l'art est difficile (*là krē tēk' e te zā', là're dā fē sēl'*), criticism is easy, art is difficult.
lade nicht alles in ein Schiff (Ger.), (*là de nikt ä'les in īn' shif'*), do not ship all in one vessel; do not put all your eggs in one basket.
l'adversité fait les hommes, et le bonheur les monstres (*là dàd ver zē tā' fe là zôm', ä le bô nōr' là môNstr'*), adversity makes men, and prosperity monsters.
la fortuna aiuta i pazzi (It.), (*là fōr tōō'nä ä yōō'tä'dzē*), fortune passes everywhere; all men are subject to the vicissitudes of Fortune.
laguna (It.), (*là gōō'nä*), a moor; a fen.
laissez faire (*le sā fer'*), let alone.
laissez-nous faire (*le sā nōō fer'*), let us act for ourselves; let us alone.
laitue (*là-tü'*).—Lettuce.
la la (*là là'*), so so; indifferently.
l'allegro (It.), (*là'l là'grō*), the merry man. (The title of one of Milton's poems.)
l'amour et la fumée ne peuvent se cacher (*là mōōr' ā là fü mā' ne pōv se kà shā'*), love and smoke cannot be hidden.
langage des halles (*läN gàzh dā àl'*), the language of markets; Billingsgate.
langouste (*läN-goost'*).—The crawfish.
langue (*läNg*).—Tongue.
lapereau (*là-p'-rō'*).—Young rabbit; cony.
la patience est amère, mais son fruit est doux (*là pā sēäNs e tà mer', me sôN früē' e dōō'*), patience is bitter, but its reward is sweet.
lapins en accolade (*là paN ä nä-kō-läd'*).—A brace of rabbits on a dish.
la povertà e la madre di tutti le arti (It.), (*là pō vär tà' e là mà'drà dē tōōt' tē là är'tē*), poverty is the mother of all the arts.
l'argent (*làr zhäN*), silver; money.
lasagne (*là-säN'y*).—Ribbonlike strips of macaroni paste; also noodles.
lasciate ogni speranza voi, che'ntrate (It.), (*là shyä'tā ō nyē spā rän'dzà vōē, kän trà' tā*), all hope abandon ye who enter here.
lassen Sie mich gehen (Ger.) (*là' sen zē mik gā'en*), let me alone.
l'avenir (*là've nēr'*), the future.
la vertu est la seule noblesse (*là ver tü' e là sōl nôbles'*), virtue is the sole nobility.
leason (*lē'son*).—Thickening, as flour, starch, egg yolk, etc.
le beau monde (*le bō môNd'*), the world of fashion; society.
lebkuchen (*lāp'koo'ken*).—A cake of flour and honey, variously flavored; also, a similar cake of flour and sugar.
le bon temps viendra (*le bôN täN' vēäNdrà'*), there's a good time coming.
le coût en âte le gout (*le kōō täN nōt le gōō'*), the expense takes away the pleasure.
le demi-monde (*le de mē môNd'*), Bohemia.
légèreté (*lā zher tā*), lightness; levity.
le grand monarque (*le gräN mô nàrk'*), the grand monarch. A title applied to Louis XIV.
le grand œuvre (*le gräN tövr'*), the great work; the search for the philosopher's stone.
legumes (*lē-gümz'*).—Peas, lentils, or beans; improperly, fruit or green vegetables.
le jeu n'en vaut pas la chandelle (*le zhō' näN vō pà là shäN del'*), the game is not worth the candle (by the light of which it is played); the object is not worth the trouble.
le mot d'énigme (*le mō dā nēgm'*), the solution of the mystery.
l'empire des lettres (*läN pēr' dā letr'*), the empire of letters.
le parole son feminine, e i fatti son maschi (It.) (*là pà rō là sōn fà mē nē'nà, à ē fät'tē sōn mäs'kē*), words are feminine, and deeds are masculine.
la pas (*le pà'*), precedence.
le point de jour (*le pwÂnd zhōōr*), daybreak.
le roi et l'état (*le rwà' à là tà*), the king and the state.
le roi le veut (*le rwà' l vö'*), the king wills it.
les absents ont toujours tort (*là zàp säN' ôN tōō zhōōr tôr'*,) the absent are always wrong.
les bras croisés (*là brà krwä ze'*), the arms crossed.
lèse majesté (*lez mà zhes tā*), high treason.
les extrêmes se touchent (*là zek strem' se tōōsh*), extremes meet.
les larmes aux yeux (*là lärm' zō zēö'*), tears in one's eyes.
les murailles ont des oreilles (*là mü rà' y zôN dā zô re' y*), walls have ears.
les plus sages ne le sont pas toujours (*là plü sazh ne l sôN pà tōō zhōōr*), the wisest are not always wise.
l'étoile du nord (*là twàl dü nôr'*), the star of the north.
le tout ensemble (*le tōō täN säN bl'*), the whole taken together.
lettre de cachet (Fr. Hist.), (*letre de kà she'*), a secret letter sealed by the royal seal, containing orders for arrest and imprisonment without trial.
lettre de change (*letre d zhäN zh*), bill of exchange; promissory note.
lettres de créance (*letre krā d äNs'*), letters of credit.
lettre de marque (*letre d màrk'*), a letter of marque or reprisal.
levée (*le vā'*), a morning reception.
lev'eret.—A young hare.
le vrai n'est toujours vraisemblable (*le vrā ne tōō zōōr vre säN blàbl'*), truth is not always probable; truth is stranger than fiction.

levreau (*lä-vrō′*).—A young hare. *Levreau au sang* (*ō sän*) is a dish of young hares cooked with added pigeon blood.
l'homme propose, et Dieu dispose (*lôm prô pōz′, ä dēō′ dēs pōz′*), man proposes and God disposes.
liaisons dangereuses (*lē ē zôn dän zhrōz′*), dangerous alliances.
libraire (*lē brer′*), a bookseller.
l'inconnu (*lân kô nü′*), the unknown.
l'incroyable (*lân krwä yäbl′*), the incredible, the marvelous. (The word incroyable was applied substantively to the fops of the directory period in the great French revolution.)
lingerie (*lân zhrē*), linen goods; also, collectively, all the linen, cotton, and lace articles of a woman's wardrobe.
littérateur (*lē tā rä tör′*), a literary man.
lo barato es caro (Sp.), (*lō bä rä′tō äs kä′rō*), a bargain is dear.
l'occhio del padrone ingrassa il cavallo (It.), (*lō′kyō däl pä drō nä ēn gräs′sä ēl kä val′lō*), the master's eye fattens the horse.
loyauté m'oblige (*lwä yō tä′ mô blēzh′*), loyalty binds me.

M

macarons (*mä-kä-rôn′*).—Macaroons.
macaro′ni.—A paste of wheat flour and water dried in the form of long slender tubes. When prepared in still smaller tubes it is called spaghetti and vermicelli.
macaroon.—A small cake composed chiefly of whites of eggs and sugar (meringue) with pounded almonds, or sometimes filberts, cocoanut, or the like.
macédoine of fruit (*mä-sä-dwän′*).—A sweet jelly with whole fruit in its substance.
macédoine of veg′etables.—A mixture of several vegetables, cooked, with some white sauce added.
macédoine sal′ad.—A salad of mixed vegetables.
ma chère (*mä sher′*), my dear (fem.).
macroon′.—A macaroon.
mademoiselle (*mäd mwä zel′*), title given to a young unmarried lady.
madère (*mä-dâr′*).—Madeira wine.
maestro di color che sanno (It.) (*mä es′trō dē kō lor′ kä sän′no*), master of those that know. (Applied by Dante to Aristotle.)
ma foi (*mä fwä′*), upon my faith; upon my word.
maigre (*mē′gr*).—Lean meat; also, any food other than meat. Also, a kind of fish. *Maigre soups* are those without meat, such as those used in Lent.
maintien le droit (*mân tēän le drwä′*), maintain the right.
maison d'arrêt (*mä zôn dä ret′*), house of custody; prison.
maison de campagne (*mä zôn de kän pän′y*), a country house.
maison de force (*mä zôn d fôrs′*), house of correction; bridewell.
maison de santé (*mä zôn d sän tä′*), lunatic asylum.
maison de ville (*mä zôn d vēl′*), a town hall.
maitre des basses œuvres (*me′tre dä bäs zövr′*), a nightman.
maitre des hautes œuvres (*me′tre dä ōt zövr′*), an executioner; a hangman.
maitre d'hôtel (*me′tre dō tel′*), a house steward.
maitre d'hôtel but′ter (*mä′tr dō-tel′*).—Butter mixed with parsley, lemon juice, salt, and nutmeg—cold *maitre d'hôtel sauce.*
maitresse (*me tres′*), mistress.
malade (*mä läd′*), sick.
maladie du pays (*mä lä dē′ dü pä ē′*), homesickness.
maladresse (*mä lä dres′*), want of tact, awkwardness.
manchons de veau à la Gérard (*män-shôn′ de vō ä lä zhä-rär′*).—A dish of slices of veal rolled and stuffed.
manège (*mä nezh′*), the art of horsemanship.
mal à propos (*mä lä prô pō′*), ill-timed.
mal de dents (*mäl de dän′*), toothache.
mal de mer (*mäl de mer′*), seasickness.
mal de tête (*mäl de tet′*), headache.
mal entendre (*mä län tä ndr′*), a misunderstanding; a mistake.
malgré nous (*mäl grä nōō′*), in spite of us.
malheur ne vient jamais seul (*mä lör′ ne vēän zhä me söl′*), misfortunes never come singly.
maraschino (*mä-rä-skē′nō*).—A cherry cordial made in Dalmatia from a sour cherry called *marasca;* hence, a similar liqueur prepared elsewhere.
marasquin (*mä-rä-skan′*).—French for maraschino.
marchand de vin (*mär-shän′ de van′*).—Stewed with shallots, espagnole, and claret wine—said especially of kidneys.
march′pane.—A cake of pounded almonds or pistachio nuts and sugar.
mardi gras (*mär dē grä′*), Shrove Tuesday.
mariage de conscience (*mä rēäzh de kôn sēäns′*), a private marriage.
mariage de convenance (*mä rēäzh de kôn vnäns′*), a marriage of convenience; or from interested motives.
marsala (*mär′sä-lä*).—A class of white Sicilian wines, of which the best kinds resemble Madeira, but are lighter.
matinée (*mä tē nä′*), a reception, or a musical or dramatic entertainment, held in the daytime.
mauvaise honte (*mô vez ônt′*), false modesty.
mauvais goût (*mô ve gōō′*), false taste.
mauvaise sujet (*mô ve sü zhe′*), a worthless fellow.
mauvais quart d'heure (*mô ve kär dör′*), a bad quarter of an hour; an uncomfortable time; a disagreeable experience.
mauvais ton (*mô ve tôn′*), vulgarity.
mayonnaise sauce (*mä-yō-näz′*).—A sauce of egg yolk and oil worked together, less properly with vinegar.
médecin, guéris-toi-toi-même (*mäd sän′, gä rē twätwä mem′*), physician, heal thyself.
mélange (*mä lä nzh*), a mixture.—A light entertainment of a mixed character.
mêlée (*me lä′*), a disorderly fight.
ménage (*mä näzh′*), household.
menu (*me nü′*), bill of fare.
mennière (*me-nyär′*).—With brown butter, lemon juice, and parsley.
meringue (*mä-rang′*).—Icing of white of egg and sugar thoroughly beaten together, sometimes with starch added. Pure meringues are called *baisers* (*bä-zä′*) or Spanish foam.
meringue glacée (*glä-sä′*).—A glazed meringue.
merluche (*mär-lüsh′*).—The haddock.
mesalliance (*mä zä lēänz′*), marriage with one of lower station.
mirabelles (*mē-rä-bel′*).—Plums of a certain superior variety.
mir ist alles einerlei (Ger.), (*Mēr′ ist ä′les ī ner lī′*), it's all the same to me.
mise-en-scène (*mē zän sen′*), the staging of a play.
mon ami (*mô nä mē′*), my friend.
mon cher (*môn sher′*), my dear (fellow).
monde chic (*môNd shēk′*), world of taste; fashionable people.
monsieur (*me sēö′*), sir, master, gentleman.
morue (*mō-rü′*).—Codfish.
mot de passe (*mō d päs′*), the watchword.
mot du guet (*mō dü ge′*), a watchword.
mot pour rire (*mō pōōr rēr′*), a witty saying; a joke.
mots d'usage (*mō dü zäzh′*), words in common use.
moules (*mool*).—Mussels.
moules à la bordelaise (*ä lä bôr-de-lāz′*).—Mussels in forcemeat.
mousseline de laine (*mōōs lēn de len′*), a thin woolen material.
mousseron (*moo-srôn′*).—Mushroom (the edible kind).
mouton (*moo-tōn′*).—Mutton.
mulled (*muld*).—Properly, heated and spiced; but often used to mean, made mild by sugar (acid wines), or by dilution (alcoholized wine).
mul′ligatawny, or **mul′ligatunny.**—A spiced or curried soup of hashed chicken and rice.
muraglia bianca, carta di matto (It.) (*mōō rä′lyä byäng′kä, kär′tä dē mät′tō*), a white wall is the fool's paper.

N

naïve (*nä ēv′*), having unaffected simplicity.
naïveté′), (*nä ēv tā′,*) native simplicity.
Na′ples biscuit.—Lady fingers.
Na′ples ice, Na′ples ice cream.—Same as Neapolitan ice; Neapolitan ice cream.
Neapol′itan ice, Neapol′itan ice cream.—Ice or ice cream prepared in layers, especially when colored, as in white, red and yellow.
Neapol′itan sauce.—Espagnole flavored with grated horseradish, and a sweet and savory wine fumet.
nec′tarine.—A smooth skinned variety of peach. The *Spanish nectarine* is a plum-like West Indian fruit, which is made into a sweet conserve.
née (*nä′*), born.
négligé (*nä glē zhä′*), a morning dress.
nesselrode pudding (*nes′sel-rō-de*).—Iced or frozen chestnut-and-fruit pudding.
neufchâtel cheese (*nûf-shä-tel′*).—A cheese made by thickening cream by heat and pressing it in a small mold.
neue Besen kehren gut (Ger.), (*nôi e bä′zen kä ren gōōt′*), a new broom sweeps clean.
ni l'un ni l'autre (*nē lôn′nē lōtr′*), neither the one nor the other.
n'importe (*nän pôrt′*), it is of no consequence.
nivernaise (*nē-vâr-näz′*).—A ragoût-like dish of carrots stewed in consommé.

noblesse oblige (*nô ble sô blēzh'*), nobility imposes obligations; much is expected from persons of good position.
nom de guerre (*nôn de ger'*), a war-name, an assumed name, a pseudonym.
nom de plume (*nôn de plüm'*), an assumed title.
nonchalance (*nôn shà lăns'*), coolness; easy indifference.
non mi ricordo (It.), (*nōn mē rē kôr'dō*), I do not remember.
non obstant clameur de haro (*nōn ôp stăn klà mör' de à rō'*), despite the hue and cry.
non ogni fiore fa buon odore (It.), (*nōn ō nyē fyō'rā fà bwô nō dō'rā*), it is not every flower that smells sweet.
nonpareil (*nôn pà re'y*), unequaled.
non vender la pelle dell 'orse prima di pigliarlo (It.), (*nōn vān dăr là pel lā dăl lōr' sā prē mà dē pē lyär'lō'*), don't sell the bearskin before you have caught the bear.
Noth kennt kein Gebot (Ger.), (*nōt' kent kīn ge bōt'*), necessity knows no law.
Notre Dame (*nô tre dàm*), Our Lady, the Virgin Mary.
n'oubliez pas (*nōō blēā pà'*), do not forget.
nougat (*noo-gä'*).—A mixture of almonds, pistachios, filberts, or the like, and honey or sugar baked together.
nouilles (*noo'y*).—Noodles.
nous verrons (*nōō ve rôn'*), we shall see.
nouvelles (*nōō vel'*), news.
nouvellette (*nōō ve let'*), a short tale or novel.
nuance (*nü ăns'*), shade; gradation; tint.
nul bien sans peine (*nül bēăn' săn pen'*), no pains, no gains.
nulla nuova, buona nuova (It.), (*nōōl là nwô vä, bwô'-nä nwô'vä*), no news is good news.

O

octroi (*ôk trwä'*), a tax on articles (for sale) entering a town.
oeil de bœuf (*ö'ēd böf'*), a bull's-eye.
œufs (*ûf*).—Eggs.
œufs à la farce (*ûf à là färs*).—Hard boiled eggs with stewed sorrel.
œufs à la tripe (*à là trēp*).—Hard boiled eggs with onion sauce.
œufs brouillés.—Scrambled eggs.
ognon (*ô-nyôn'*).—Onion.
ognon d'Egypte (*dà-zhēpt'*).—The rocambole, a mild, sweet onion.
o'kra.—A plant, the long green, mucilaginous pods of which are used in soups, stews, etc.
olla (*ôl'là*).—Ragoût.
olla podrida (It.), (*ôl'là pō drē'dä*), a heterogeneous mixture.
omelette au thon (*ōm-let' ō tôn'*).—Omelet with tunny, a kind of fish.
omelette aux confitures (*ō kôn-fē-tür'*).—An omelet served with fruit jelly. Jams do not go well with omelets.
on connait l'ami au besoin (*ôn kô ne là mē' ō be zwăn'*), a friend is known in time of need.
on dit (*ôn dē'*), they say.
oreilles (*ô-rā'y*).—Ears; as, *oreilles de veau* (*de vō*), calf's ears.
orgeade (*ôr-zhäd'*).—Milk of almonds, made by stirring sirup of almonds in water; also, orgeat.
orgeat (*ôr-zhä'*).—Sirup of almonds; also, orgeade.
Or'leans sauce.—A mince of carrots, anchovies, hard-boiled eggs, and gherkins, with peppersauce.
oro e che oro vale (It.), (*ô'rō e kā ô'rō vä'lā*), that is gold which is worth gold; all is not gold that glitters.
oublier je ne puis (*ōō blēā'zhe n pwē'*), I can never forget.
oui-dire (*wē dēr'*), hearsay.
outrance (*ōō trăns'*), excess; extremity.
outre (*ōōtr'*), eccentric.
ouvrage (*ōō vrázh*), work.
ouvrage de longue haleine (*ōō vrázh de lông à len'*), a long-winded business.
ouvrier (*ōō vrē ā'*), a workman, an artisan.

P

pabrica (*pä'brē-kä*).—Paprika.
padrone (It.), (*pä drō'nä*), master; employer; landlord.
pain (*pan*).—Bread.
panais (*pä-nā'*).—Parsnips.
panée (*pä-nā'*).—Bread-crumbed (over egg yolk, sauce, butter, or fat) previous to frying.
panièr (*pä-nyä'*).—A basket, as that for holding a wine bottle. Also, an entrée panée.
pannequets (*pän-kā'*).—French pancakes.
papeterie (*pà pe trē'*), a case with writing materials.
paprika (*pä'prē-kä*).—A mild kind of red-pepper condiment obtained from *Capsicum annum.*
par accord (*pà rà kôr'*), by agreement.
par avance (*pà rà văns'*), in advance.
par ci, par là (*pàr sē' pàr là'*), here and there.
par excellence (*pà rek se lăns'*), preëminently.
par exemple (*pà răg zănpl'*), for instance.
parfaitement bien (*pàr fet măn bēăn'*), perfectly well.
Pari'sian loaves.—Finger cakes ornamented with strips of currant jelly, green-gage jam, or the like.
Pari'sian sauce.—Allemande flavored with truffles and tinted.
pas'caline.—White mushroom sauce.
parole d'honneur (*pà rôl dô nör'*), word of honor.
partout (*pàr tōō'*), everywhere.
parvenu (*pàr ve nü'*), a person of low origin who has risen; upstart.
pas à pas (*pà zà pà'*), step by step.
passe (*pàs*), worn out; out of style.
passe-partout (*pàs pàr tōō'*), a master key.
pasticcio (It.), (*pàs tēch' chyō*), patchwork.
pâté (*pä-tā'*).—A pasty.
pâté aux choux (*pä-tā' ō shoo'*).—Cream-cake paste, which resembles a cabbage head when baked.
pâté de foie gras (*pä tā' de fwä grä'*), a pie made in Strasburg from the livers of geese.
pâté mollette (*pä-tā' mô-let'*).—A Mecca cake.
pâtés (*pä-tā'*).—Pasties.
pâtés chauds (*shō*).—Hot pasties.
pâtés de petit four (*de pe-tē'foor*).—Small pasties—literally, pasties of the little oven.
pâtés froids (*frwä*).—Cold pasties.
patois (*pà twä'*), a dialect.
pays latin (*pä ē là tăn'*), the Latin territory, district, region; the students of the Pays Latin, that is, of the University.
peine forte et dure (*pen fôr tā dür'*), very severe punishment; a kind of judicial torture.
penchant (*pän shän'*),—inclination; liking.
pensée (*pän sä'*), a thought expressed in terse, vigorous language.
per (It.), (*pär*), for, through, by.
per cantante (It.), (*pär kän tän'tā*), for cash.
per contra (It.), (*pär kōn'trä*), on the contrary.
père de famille (*per de fà mē'y*), the father of the family.
perdreux (*pàr-drû'*).—Young partridges.
perdrix (*pàr-drē'*).—A partridge.
perdu (*per dü'*), lost.
per mese (It.), (*pär mā' sā*), by the month.
per piu strade si va a Roma (It.), (*pär pyōō strä'dā sē vä à rō'mä*), there are many roads to Rome.
persiflage (*per sē flázh*), chaff; banter.
persillade of fish (*pàr-sē-lād'*).—Fish with parsley.
personnel (*per sô nel'*), the staff of an establishment.
petit (*pe tē'*), small.
petit coup (*pe tē kōō'*), a small mask; a domino.
petit rôti (*pe-tē' rô-tē'*).—A roast fowl.
petit salé (*sā lā'*).—Pickled pork in small pieces.
petites affiches (*pe tēt zà fēsh'*), advertisements.
petit maître (*pe tē metr'*), a little master; a fop.
petits choux.—Same as choux pâtissière.
petits fois (*pe-tē' fwä*). Peas.
peu-à-peu (*pö à pö'*), little by little; by degrees.
peu de chose (*pö d shôz'*), a trifle.
pezzo (It.), (*ped'zō*), piece; piece of money; a coin.
piccolo (It.), (*pēk'kō lō*), small.
pièce de résistance (*pē es de rā zēs tăns'*), the principal dish.
pied à terre (*pēā tà ter'*), a temporary lodging.
pied poudreux (*pē ā pōō drö'*), a vagabond.
pigeonnaux (*pē-zhō-nō'*).—Squabs.
pigeons innocents (*pē-zhôn' ē-nō-săn'*).—Squabs.
pigliar due colombi a una fava (It.), (*pē lyär dōō ā kō lōm'bē à ōō nä fä'vä*), to catch two pigeons with one bean; to kill two birds with one stone.
pilau (*pi-law'*), or **pillau.**—An oriental dish of rice stewed with mutton, lamb, or fowl, almonds, raisins, and saffron and other spices.
pimen'to.—Allspice, or Jamaica pepper.
pimo'la.—An olive stuffed with sweet peppers.
piouplou (*pē ōō pē ōō'*), a private soldier; a French "Tommy Atkins."
piquant (*pē-kăn'*), pointed, pungent.
piquante sauce (*pē-kănt'*).—Espagnole with pickles added and flavored with shallots.
pis aller (*pē zà lā'*), the worst or last shift.
plombière (*plôn-byär'*).—A kind of frozen fruit pudding.
poché (*pō-shā'*).—Poached.
poco à poca (It.), (*pô'kō à pô'kō*), little by little; by degrees.
point d'appui (*pwăn dà pwē'*), prop; point of support.
poisson (*pwä-sôn'*).—Fish.
poivrade (*pwä-vrād'*).—Peppersauce.
polen'ta.—Porridge.

polonaise cakes (*pō-lō-nāz'*).—A kind of tart made of puff paste with jelly at the corners.
pomme (*pum*).—Apple.
pomme d'api (*pum dà-pē'*).—Small rosy apple.
pomme de terre (*de târ*).—Common Irish potato.
pompa'no.—A highly esteemed marine food fish.
porte-chaise (*porte shez'*), a sedan.
poste restante (*pôs tres tăNt'*), to remain until called for; applied to letters in a post office, general delivery.
potage (*pō-tăzh'*).—Soup; pottage; broth.
potage a la Camerani (*à là kà-mà-rà'nē*).—A rich kind of chicken-liver soup.
potage croute au pot (*kroōt ō pō*).—Plain broth with vegetables and crusts browned in gravy.
pot pourri (*pō poo-rē'*).—A ragoût of various meats and vegetables cooked together.
pour acquit (*pōō rà kē'*), paid; settled; the usual form of receipt.
pour faire rire (*pōōr fer rēr'*), to excite laughter.
pour faire visite (*pōōr fer vē zēt'*) to pay a visit.
pour passer le temps (*pōōr pà sà l tăN'*), to while away the time.
pour prendre congé (*pōōr prăNdre kôN zhà'*), to take leave. Usually abbreviated to *P. P. C.*
précis (*prà sē'*), a summary; an epitome.
prendre la clef des champs (*prăN dre là klà dà shăN'*), to take the key of the fields; to take French leave.
prendre la lune avec les dents (*prăN dre là lü' nà vek là dăN'*), to seize the moon in one's teeth; to aim at impossibilities.
presto maturo, presto marcio (It.) (*pres tō ma tōō'rō, pres tō mär'chyō*), soon ripe, soon rotten.
prêt d'accomplir (*pre dà kôN plēr'*), ready to accomplish.
prêt pour mon pays (*pre pōōr môN pà ē'*), ready for my country.
preux chevalier (*prō shvà lēà'*), a brave knight.
prima donna (*prē mà dôn'nà*), leading lady singer in opera.
printanière (*praN-tà-nyâr'*).—A dish cooked à la printanière. See *à la printanière.* Printanière soup is the same as jardinière soup, essentially.
procès verbal (*prô se ver bàl'*), a detailed statement.
profiterolles (*prō-fē-trōl'*).—Sweet entremets, a kind of cake filled with custard.
propriétaire (*prô prēà ter'*), a proprietor.
protégé (*prô tà zhà'*), one protected by another.
pumpernickel (*poom'per-nik'l*).—Black bread made in Westphalia of unbolted rye. It is of an acid taste.
purée (*pü-rà'*).—A pulpy maceration of meat, vegetables, fruit, or the like, passed through a sieve.
quartier (*kär-tyà'*).—Quarter; especially forequarter.
quasi de veau (*kà-zē'de vō*).—The thick end of a loin of veal.

Q

quelque chose (*kel ke shōz'*), something; a trifle.
quenelle (*ke-nel'*).—A kind of delicate forcemeat ball or dumpling.
qui a bu boira (*kē à bü' bwà rà'*), the tippler will go on tippling; it is hard to break off bad habits.
quien poco sabe, presto lo reza (Sp.), (*kyăn pō kō sà'và, prēs tō lō rà'thà*), he who knows little soon tells it.
quien sabe? (Sp.), (*kyăn sà'và*), who knows?
qu'il soit comme il est désiré (*kēl swà' kô mē le dà zē rà'*), let it be as desired.
qui m'aime aime mon chien (*kē mem' em môN shēàN'*), love me, love my dog.
qui n'a santé, n'a rien (*kē nà săN tà', nà rē àN'*), he who has not health, has nothing.
qui va là? (*kē và là'*), who goes there?
qui vive (*kē vēv'*), on the alert.

R

raconteur (*rà kôN tōr'*), a relater; a teller.
radis (*rà-dē'*).—Radish.
ragout (*rà-goo'*).—A rich compound consisting of quenelles, mushrooms, truffles, etc., mixed with a rich sauce, and used to garnish rich dishes; also, a dish garnished with this.
raison d'état (*rà zôN dà tà'*), a state reason.
raison d'être (*rà zôN detr'*), the reason for a thing's existence.
ramequin (*ram'ē-kin;* French pron. *rà-me-kaN'*).—A pastry consisting of a preparation of cheese inclosed in or mixed with puff paste, and baked or browned. Cheese straws are thin ramequins of cheese mixed with puff paste.
rapprochement (*rà prôsh măN'*), the act of bringing together, reconciliation.
ratafià (*rà-tà-fē-à'*).—(*a*) Noyau, curacao, or other liqueur containing kernels of fruit, as of peaches, cherries, etc. (*b*) A small macaroon made mainly of bitter almonds.
réchauffé (*rà-shō-fà'*), or **réchauffée.**—Warmed or heated over a second time.
recherche (*re shersh'*), elegant; attractive.
recu (*re sü'*), received; receipt.
recueil choisi (*re kō y shwàzē'*), a choice collection.
rédacteur (enchef), (*rà dàk tō răN shef*), editor (of a newspaper).
régime (*rà zhēm'*), government; mode of living.
relevés (*rà-l'-và'*).—Same as removes.
rémoulade (*rà-moo-lăd'*).—A purée of anchovies, capers, parsley, shallots, and hard-boiled eggs, dressed with spices, oil, and vinegar.
rémoulade à la provençale (*à là prō-văN-sàl'*).—Rémoulade not sieved and with more oil.
remove.—A dish removed from the table to make room for another; applied generally to the roasts, joints, turkeys, fillets, etc., which follow the soup and fish at an ordinary dinner of several courses.
renaissance (*re ne sănS'*), regeneration, revival.
rendezvous (*răN dà vōō'*), a place of meeting.
rentes (*răNt'*), the funds; government stocks.
répondez s'il vous plaît (*R. S. V. P.*) *rà pôN dà sēl vōō ple'*), reply if you please.
répondre en normand (*rà pôN drăN nôr măN'*), to answer in Norman; to speak evasively.
restaurateur (*res tô rà tōr'*), one who provides.
résumé (*rà zü mà'*), a summing up.
rete nuova non piglia uccello vecchio (It.), (*rà tà nwô'và nōn pē lyà ōōch chel'lō vek'kyō*), a new net won't catch an old bird.
revenons à nos moutons (*rev nôN zà nō mōō tôN'*), let us return to our sheep; let us come back to our subject.
rien n'est beau que le vrai (*rēàN ne bō' ke l vrà'*), there is nothing beautiful but truth.
rira bien qui rira le dernier (*rē rà bēàN' kē rē rà l der nēà'*), he laughs well who laughs last.
rire entre cuir et chair, rire sous cape (*rē răN tre kwē' rà sher', rēr sōō kàp'*), to laugh in one's sleeve.
ris de veau (*rē de vō*).—The sweetbread; pancreas.
rissole (*rē-sōl'*).—A kind of pastry made of minced and spiced meat or vegetables, or fruit, wrapped in paste, and fried in fat—originally one containing rice as an ingredient.
rissolé (*rē-sō-là'*).—Browned by baking or frying.
rissolette (*rē-sō-let'*).—A croutade, or bit of fried bread containing or holding a little portion of forcemeat.
robe de chambre (*rôb de shàN br'*), a dressing-gown; a morning gown.
robe de nuit (*rôb de nwē'*), a night-dress.
rognons (*rō-nyôN'*).—Kidneys; fries.
rôle (*rōl'*), a part in a performance.
romaine salad (*rō-mān'*).—A kind of mixed vegetable salad.
Ro'man punch.—A water ice flavored, as with lemon, and mixed with rum or other spirits. Also, a complicated punch, similar in preparation to regency punch, with added frozen white of egg froth.
roquefort (*rōk-fôr'*).—A French cheese made from the milk of ewes, cured in a cavern in the limestone rock at Roquefort, France.
rothe grütze (*rō'te grüt' se*).—A flummery of rice grits and fruit juice.
roue (*rōō*), a debauchee.
rouge (*rōōzh*), red coloring for the skin.
roulette (*roo-let'*).—A dish consisting of a slice of meat spread with stuffing, rolled, and stewed or braised.
roux (*roo*).—Browned by frying in butter or other grease.
roux blanc (*blàN*).—Starch or flour fried in fat so as to be hardly colored.
roux brun (*brüN'*).—Fried a dark brown.
ruse de guerre (*rüz de ger'*), a military stratagem.
Rus'sian sauce.—A velouté with egg yolks and strong herbs.
Rus'sian soup.—A gravy soup of veal, fowl, etc., with souchets of salmon, eel, perch, mullet, quenelles of whiting, lobster coral, and mushroom purée.

S

salad russe (*sà-lăd'rüs*).—A dish of chicken meat, ham, veal, etc., sliced, arranged separately and served with truffles, and tartar sauce, or caviare and sardelles, etc.
salle (*sàl*), a hall.
salle à manger (*sà là măN zhà*), dining room.
Sal'ly Lunn.—An English tea cake.
salmagun'dy.—A salad of cold chicken, veal, eggs, beets, anchovies, etc., finely minced and spiced.
salmis (*sàl-mē'*).—A ragoût of roast game or fowl in rich gravy or sauce.
sal'picon (French pron. *sàl-pē-kôN'*).—A ragoût or rich compound of chopped meat or fish and vegetables with savory sauce, used as a separate dish, as a garnish, to stuff meats, etc.

sanan couchilladas, mas no malas palabras (Sp.), (*sä'nän kōō chē lä'thäs, mäs nō mä läs pä lä'vräs*), wounds from a knife will heal, but not those from an evil tongue.
sang-froid (*säN frwä'*), coolness; self-possession.
sans-culottes (*säN kü lôt'*), without breeches; a term applied to the rabble of the French revolution.
sans façon (*säN fä sôN'*), without form or trouble.
sans pareil (*säN pä re'y*), without equal.
sans peine (*säN pen'*), without difficulty.
sans peur et sans reproche (*säN pör' ä säN re prôsh'*), fearless and stainless.
sans rime et sans raison (*säN rēm' ä säN rä zôN'*), without rhyme or reason.
sans souci (*säN sōō sē'*), free from care.
sauce beurrée à l'Anglaise (*bü-rā ä läN-glāz'*).—Butter sauce.
sauce blanche (*blänsh*).—Butter sauce.
sauce Colbert (*kōl-bâr*).—Brown sauce with meat glace, lemon juice, parsley, and butter stirred in.
saucé de gourmets (*de goor-mä'*).—A coulis with a purée of tomatoes and crayfish butter.
sauce en tortue (*äN tôr-tü'*).—Espagnole sauce, a kind of sauce used for calf's head.
sauce Italienne rousse (*ē-tä-lyen' roos*).—A sauce of espagnole, varied and flavored with shallots, mushrooms, and olive oil.
sauce piquante (*pē-käNt'*).—An acid or sour sauce.
sauce Robert (French pron. *sōs rō-bâr'*).—A full-flavored espagnole sauce, strongly flavored with onions, mustard, and zested with lemon juice or vinegar.
sauce rousse (*roos*).—Brown sauce.
saumon (*sō-môN'*).—Salmon.
sauté (*sō-tā'*).—Lightly and quickly fried in little grease.
sauve qui peut (*sōv kē pö'*), save yourself.
savant (*sä väN'*), a learned man.
savoir (*sä vwär'*), knowledge.
savoir faire (*sä vwär fer'*), tact.
savoir vivre (*sä vwär vēvr'*), good breeding.
savon (*sä vôN'*), soap.
savoy' cakes.—Lady fingers or other fancy cakes of sponge-cake paste.
scones (*skönz*).—Scotch cakes of oatmeal or flour.
scrutin d'arrondissement (*skrü tän' dä rôN dēs mäN'*), municipal ballot.
scrutin de liste (*skrü tän d lēst'*), voting by ballot; the voting for the departmental representatives.
sdegno d'amante poco dura (It.), (*zdä nyö dä män'tä pô kō dōō'rä*), a lover's anger is short-lived.
séance (*sä äns'*), a sitting.
selle (*sel*).—Saddle.
selon les reglès (*se lôN lä regl'*), according to rule.
sempre il mal non vien per nuocere (It.), (*sem'prä ēl mäl' nōn vyän' pär nwô chä rä*), misfortune is not always an evil.
se non e vero e ben trovato (It.), *sä nōn e vā'rō e bän trō vä'tō*), if it is not true, it is cleverly invented.
siècle (*sē ekl'*), an age.
siècle d'or (*sē ekl dôr'*), the golden age (of Louis XIV).
siècles des ténèbres (*sē ekle dä tā nebr'*), the dark ages.
Sie sehen gut aus (Ger.), (*zē zä en gōōt' ows*), you look well.
sobriquet (*sô brē ke'*), a nickname.
soi-disant (*swä dē zäN'*), self-styled; would-be; pretended.
soirée (*swä rä'*), an evening party.
soubise sauce (*soo-bēz'*).—A purée of white onions or souchie.
soubrette (*sōō bret'*), on the stage a servant girl who acts in comedies the part of an intrigante.
souchet (*soo-shä'*), or **souchie** (*sōō-shē'*).—A stew of fish in a soup-like savory broth.
soufflé (*soo-flä'*).—A dish consisting of batter of starch or flour, eggs, milk or cream, and butter, beaten light and baked and served hot while light and spongy. Soufflés may be variously flavored, as with ginger, vanilla, chocolate, etc.
souffler le chaud et le froid (*sōō fla l shô' ä l frwä'*), to blow hot and cold.
spaghetti (*spä-get'tē*).—Hollow tubes of dried Italian paste, in size between macaroni and vermicelli.
Span'ish cream.—Gelatine pudding containing custard, gelatine, and beaten white of eggs, set in a mold.
Span'ish puffs.—Maringues.
spirituel (*spē rē tü el'*), possessing wit, witty.
Sturm und Drang (Ger.), (*shtoorm oont dräng'*), storm and stress.
suprême sauce (*su-prām*).—Velouté flavored with mushrooms and consommé of fowls.

T

tableau vivant (*tä blō vē väN'*), the representation of a picture by persons grouped together, silent and motionless.
table d'hôte (*täble dōt'*), table according to the hostess.
tâche sans tâche (*täsh säN täsh'*), a work without a stain.
taille (*tä'y*), form; stature; shape.
tapis (*tä pē'*), the carpet.
tar'tare sauce.—Mayonnaise sauce with vinegar and chopped green herbs, pickles, and capers.
tel maître, tel valet (*tel metr', tel vä le'*), like master, like man.
tendresse (*täN dres'*), passion; affection.
terra cotta (It.), (*ter'rä kôt'tä*), baked earth.
tête (*tät*).—Head.
tête-à-tête (*te tä tet'*), a conversation between two parties.
tiens à la vérité (*tēäN zä lä vä rē tä'*), maintain the truth.
tiens ta foi (*tēäN tä fwä'*), keep thy faith.
timbale (French pron. *taN-bäl'*).—A drum-like case of macaroni or rice filled with some composition, as with forcemeat or ragoût.
timbre-poste (*tän bre pôst'*), postage stamp.
toujours perdrix (*tōō zhōōr per drē'*), always partridges; the same thing over and over again.
toujours prêt (*tōō zhōōr pre'*), always ready.
tour de force (*tōōr de fôrs'*), a feat of strength or skill.
tour d'expression (*tōōr dek spre sēôN'*), an idiom.
tourner casaque (*tōōr nä kä zäk'*), to turn one's coat; to change sides.
tout-à-fait (*tōō tä fe'*), wholly, entirely.
tout-à-l'heure (*tōō tä lör'*), instantly.
tout au contraire (*tōō tō kôn trer'*), on the contrary.
tout-à-vous (*tōō tä vōō'*), entirely yours.
tout bien ou rien (*tōō bēäN' ōō rēäN'*), all or nothing.
tout-de-suite (*tōō d swēt'*), immediately.
tout ensemble (*tōō täN säNbl'*), the whole.
tout le monde est sage après coup (*tōō l môN de sazh ä pre kōō'*), everybody is wise after the event.
traduttori, traditori (It.), (*trä dōōt tō'rē, trä dē tō'rē*), translators are traitors.
trottoir (*trô twär'*), sidewalk.
trousseau (*trōō sō'*), wedding outfit.
truffes (*trüf*).—Truffles.
truf'fle.—A kind of edible mushroom that grows underground.
truite (*trwet*).—Trout.
Turk'ish cof'fee.—Café au Turc.
tutte le strade conducono a Roma (It.), (*tōōt'tä lä strä'dä kōn dōō'kō nō ä rō mä*), all roads lead to Rome.
tutti-frutti (*toot'tē-froot'tē*).—A confection consisting of preserved fruits of various kinds.

U

Uebung macht den Meister (Ger.), (*ü'boong mäkt den mīs'ter*), practice makes perfect.
un bienfait n'est jamais perdu (*öN bēäN fe' ne zhä me per dü'*), a kindness is never lost.
un sot à triple étage (*öN sō' ä trē plä tázh'*), a consummate fool.
un "tiens" vaut mieux que deux "tu l'auras," (*öN tēäN vō mēö' ke dö tü lō rä'*), one "take it" is worth two "you shall have it"; a bird in the hand is worth two in the bush.

V

valen'cia rice.—Rice boiled till the grains are soft and then mixed with oil and tomatoes.
valet de chambre (*vä le d shäN br'*), an attendant.
vaurien (*vō rēäN'*), a worthless fellow.
veau (*vō*).—Veal.
vedi Napoli e poi muori (It.), (*vā dē nä'pō lē ä pôē mwô'rē*), see Naples and then die.
vérité sans peur (*vä rē tä' säN pör'*), truth without fear.
vers de société (*ver de sô sē ä tä'*), society verses; poetry dealing lightly with trifling subjects.
verve (*verv*), animation; spirit.
Viele Hände machen bald ein End (Ger.), (*fē le hent'-mäken bält in ent'*), many hands make quick work.
vieux garçon (*vē ö gär sôN'*), old bachelor.
vigueur de dessus (*vē gör' de de sü'*), strength from on high.
vin (*vaN*).—Wine.
vinaigre (*vē-nā'gr'*).—Vinegar. *Vinaigre a l'éstragon* (*ä lās trä-gôN'*) is vinegar flavored with tarragon.
vinaigrette (*vē-nā-gret'*).—A sauce made sour by acid wine or vinegar.
vino dentro, senno furore (It) (*vē'nō den'trō, sän'no fōō rō'rä*), when the wine is in, the wit is out.
vin ordinaire (*vaN ôr-dē-nâr'*).—Ordinary table wine; claret.

virtuoso (It.), (*vēr twō′ sō*), one skilled in matters of taste or art.
vis à vis (*vē zà vē*), face to face.
vivat (*vē vàt′*), a shout of "long live."
vive la bagatelle (*vēv là bà gà tel′*), success to trifles.
vive la république (*vēv là rā pū plēk′*), long live the republic.
vive l'empereur (*vēv lăN prōr′*), long live the emperor.
vive le roi (*vēv le rwà′*), long live the king.
voilà (*vwà là′*), see there; there is, there are.
voilà tout (*vwà là tōō′*), that is all.
voilà une autre chose (*vwà là ü nō tre shōz′*), that is quite another thing.
voiture (*vwà tūr′*), a carriage.
volaille (*vō-lā′y*).—Poultry.
vol-au-vent (*vō-lō-vàN′*). A light puff-paste case baked and then filled with a ragoût, fricassée, or the like.

W

wagon-lits (*và gô lē,*) sleeping cars.
Was fehlt Ihnen? (Ger.), (*vàs fālt′ ē nen*), what is the matter with you?
Wie die Arbeit, so der Lohn (Ger.), (*vē dē är′bīt, zō der lōn′*), as the labor, so the reward.
Welsh rare bit, or **rab′bit.**—A dish consisting essentially of toasted bread on which is served toasted or melted cheese. The cheese is variously prepared, as with the admixture of ale, or other flavoring material.
white sauce.—Same as velouté, or similar sauce.
wiener schnitzel (*vē′ner shnits′el*).—A cut of veal from the leg, fried in batter, and seasoned with paprika, etc., after a style attributed to the Viennese.

Z

Zeitgeist (Ger.), (*tsīt′gīst*), the spirit of the age.

PRONOUNCING DICTIONARY OF CLASSIC WORDS AND PHRASES

Including legal phrases, maxims, mottoes, quotations, proverbs, Latin abbreviations, classic allusions and references of common occurrence in books, periodicals, newspapers and speech.

KEY TO PRONUNCIATION

The long (marked) vowels are pronounced as in the following words: *fāte, fāre, cāre; mē; mīne; mōte; mūte.* The short vowels, which include all not marked as above, are pronounced as in the following words: *pat; pet; pit; pot; put.* The accented syllable in each word is indicated by a mark placed immediately after it.

A

Ab extra (*ex′trā*).—From without.
Ab initio (*in-ish′i-ō*).—From the beginning.
Ab origine (*or-ij′jin-e*).—From the commencement.
Ab ovo (*ō′vō*).—From the egg—*i. e.*, the beginning. The egg in many ancient mythologies was the supposed origin of life.
Ab ovo usque ad mala (*us′kwe ad mā′la*).—From the egg to the apples—*i. e.*, from the beginning to the end (the Roman custom being to begin dinner with eggs and end with fruit).
Ab uno disce omnes (*ū′nō dis′se om′nēs*).—From a single instance infer the whole.
Ab urbe condita—A. U. C. (*ur′be kon′di-tā*).—From the (year of) building the city (Rome), 753 B. C.
A capite ad calcem (*ā kap′i-te ad kal′sem*).—From head to heel.
Accipe hoc (*ak′sip-e hock*).—Accept this.
Ac etiam (*ak esh′i-am*).—And also.
Ad arbitrium (*ar-bit′ri-um*).—At pleasure.
Ad captandum vulgus (*cap-tan′dum vul′gus*).—To catch the rabble.
Ad extremum (*ex-tre′mum*).—At last.
Ad finem (*fī′nem*).—To the end.
Ad hominem (*hom′in-em*).—To the man.
Ad infinitum (*in-fi-nī′tum*).—To infinity.
Ad interim (*in′ter-im*).—Meanwhile.
Ad Kalendas Graecas (*kal′en-das grē′kas*).—At the Greek kalends—*i.e.*, never (there being no kalends in the Greek year).
Ad libitum (*lib′it-um*). At pleasure.
Ad majorem Dei gloriam (*mā-jor′em Dē′ī glor′i-am*).—For the greater glory of God. The motto of the Order of the Jesuits, founded by Ignatius Loyola (1539).
Ad nauseam (*naw′se-am*).—To disgust.
Ad quod damnum (*kwod dam′num*).—To what damage.
Ad referendum (*ref-er-en′dum*).—For further consideration.
Ad rem.—To the point.
Ad unguem (*un′gwem*).—To a nail—*i.e.*, to a nicety, exactly. An expression borrowed from sculptors, who in modeling, give the finishing touch with the nail.
Ad unum omnes—Cicero (*ū-num om′nēs*).—All to a man.
Ad valorem (*va-lor′em*).—According to the value.
Ad vivum (*vī′vum*).—To the life.
Aegrescit medendo (*e-gres′sit med-en′dō*).—The disorder increases with the remedy, *i.e.*, the remedy is worse than the disease.
Aequam servare mentem (*ē-kwam ser-vār′e men′tem*).—To preserve a well-balanced mind; to be unmoved.
Aequo animo (*ē′kwo an′im-o*).—With resignation, contentedly.
Aetatis suae (*ē-tā′tis sū′ē*).—Of his (or her) age.
A fortiori (*for-shi-or′ī*).—With stronger reason.
Alere flammam (*al′er-e flam′mam*).—To feed the flame.
Alias (*al′i-as*).—Otherwise.
Alibi (*al′i-bī*).—Elsewhere. Legal phrase implying that the accused in a criminal case was not on the scene of a crime at the time of its committal.
Alma Mater (*al′ma mā′ter*).—Benign mother. An expression used by college men, who speak of their college as their *Alma mater.*
Alter ego (*al′ter egg′o*).—Another self.
Alter idem (*al′ter ī-dem*).—Another exactly similar.
Amantium irae amoris integratio est—(*am-an′shi-um ī′rē a-mor′iss inte-grā-shi-o est*).—The quarrels of lovers are renewals of love.
A mensa et thoro (*ā men′sā et thor′ō*).—From table and bed. A legal phrase used by the judge in pronouncing the decree of separation in the Divorce Court.
Amicus humani generis (*am-ī-cus hu-mā′nī gen′er-iss*).—A friend of the human race.
Amor patriæ (*am′or pat′ri-ē*).—Love of one's native land.
Anguis in herba—Virgil (*an′gwiss in her′bā*).—A snake in the grass.
Animo et fide (*an′im-o et fī′dē*).—By courage and faith.
Anno aetatis suae (*an′no ē-tā′tiss sū′ē*).—In the year of his (or her) age.
Anno Christi, A. C. (*an′no kriss′tī*).—In the year of Christ.
Anno Domini, A. D. (*an′no Dom′inī*).—In the year of our lord.
Anno mundi, A. M. (*an′no mun′dī*).—In the year of the world. The date of the Creation is given by Bishop Usher as 4004 B. C.
Ante meridiem, A. M. (*an′te mer-ī′di-em*).—Before noon.
A posse ad esse (*ā poss′e ad ess′e*).—From possibility to actuality.
A posteriori (*ā pos-tē-ri-or′ī*).—From the effect to the cause; that is, an argument by induction.
A priori (*ā prī-or′ī*).—From the cause to the effect; that is, an argument by deduction.
Aqua fortis (*ak′wa for′tiss*).—Strong water. A common name for nitric acid.
Aqua vitae (*ak′wa vī′tē*).—Water of life. Alcohol, brandy.
Arbiter elegantiarum (*ar′bit-er ele-gan-shi-air′um*).—An authority in matters of taste.
Arcana imperii (*ar-kā′na im-per′i-ī*).—Secrets of the state.
Ardentia verba (*ar-den′shi-a ver′ba*).—Burning words.
Argumentum ad hominem (*ar-gu-men′tum ad hom′-i-nem*).—An argument to the man. An argument in refutation drawn from an opponent's own principles.
Argumentum ad invidiam (*ar-gu-men′tum ad in-vid′-i-am*).—An argument appealing to low passions.
Argumentum ad judicium (*ar-gu-men′tum ad ju-dish′i-um*).—An appeal to the judgment.
Argumentum ad populum (*ar-gu-men′tum ad pop′-u-lum*).—An appeal to popular prejudice.
Argumentum baculinum (*ar-gu-men′tum back-u-lī-num*).—The argument of the cudgel; appeal to force. Club-law.
Ars celare artem (*ars sell-air′e ar′tem*).—True art is to conceal art.
Ars longa, vita brevis (*ars lon′ga vī′ta brev′iss*).—Art is long, life short.
Artium magister, A. M. or M. A. (*ar′ti-um ma-jis′ter*).—Master of Arts.
Audi alteram partem (*aw′dī al′ter-am par′tem*).—Hear the other side.
Aura popularis—Cicero (*aw′ra pop-u-lair′iss*).—The shifting breeze of popular favor.
Aurea mediocritas—Horace (*aw′re-a med-i-ok′ri-tass*).—The golden mean.
Aut Cæsar, aut nullus (*awt Cæsar awt nul′lus*).—Either Cæsar or no one.

Aut vincere aut mori (*awt vin'ser-e awt mor'ī*).—Either to conquer or to die.
A verbis ad verbera (*ā ver'bīs ad ver'ber-a*).—From words to blows.
A vinculo matrimonii (*ā vin'ku-lō mat-ri-mō'nī-ī*).—From the bond of marriage.
Bis dat, qui cito dat (*biss dat kwī sī'tō dat*).—He gives twice who gives quickly.
Bona fide (*bō'nā fī'dē*).—In good faith.
Brevis esse laboro, obscurus fio—Horace (*brev'iss ess'e lab-or'ō ob-skur'rus fīo*).—When I strive to be concise I become obscure.
Brutum fulmen (*Bru'tum ful'men*).—A harmless thunderbolt.
Cacoethes loquendi (*kak-o-ē'thēs lo-kwen'dī*).—An itch for speaking.
Cacoethes scribendi (*skrī-ben'dī*).—An itch for scribbling.
Capias (*kap'i-ass*).—You may take. A writ to authorize the seizure of a defendant's person (legal).
Caput mortuum (*kap'ut mor'tu-um*).—The dead head—*i.e.*, the worthless remains.
Caret (*care'et*).—It is wanting.
Casus belli (*kā'sus bell'ī*).—A cause for war.
Caveat actor (*kav'e-at ak'tor*).—Let the doer beware. Law term signifying a notice to stay legal proceedings.
Caveat emptor (*emp'tor*).—Let the purchaser beware. Term used to show that the vendor does not hold himself responsible for the condition of the goods.
Cetera desunt (*sē'ter-a dē-sunt*).—The rest is wanting.
Ceteris paribus (*sē'ter-is pair'i-bus*).—Other things being equal.
Circa—*c.* (*sir'kā*).—About, towards (of time).
Circulus in probando (*sir'ku-lus in pro-ban'dō*).—A circle in the proof; using the conclusion as one of the arguments.
Cogito ergo sum (*coj'i-tō er'gō sum*).—I think, therefore I exist. The famous dictum of Descartes, the philosopher.
Commune bonum (*com-mū'ne bō'num*).—A common good.
Compos mentis (*com'pos men'tiss*).—Of sane mind.
Conscia mens recti (*con'shi-a mens rek'tī*).—A mind conscious of rectitude.
Contra bonos mores (*con'tra bō'nōs mor'ēz*).—Against good manners.
Copia verborum (*cō'pi-a ver-bor'um*).—Plenty of words.
Coram nobis (*cor'am nō'biss*).—In our presence; before us.
Corpus delicti (*cor'pus de-lik'tī*).—The body, *i. e.* substance, of the offense.
Crimine ab uno disce omnes (*krī'min-e ab ū'nō dis'se om'nēz*).—From one crime learn the nature of all.
Cui bono? (*kī bō'nō*).—For whose benefit is it?
Cum grano salis (*cum grā'nō sā'lis*).—With a grain of salt, *i. e.*, with some allowance.
Cum privilegio (*priv-i-le'ji-ō*).—By privilege.
Curiosa felicitas (*ku-ri-ō'sa fē-lī'si-tas*).—Felicity of expression.
Data (*dā'ta*).—Things given or taken for granted.
De auditu (*dē aw-dī'tū*).—By hearsay.
Deceptio visus (*dē-sep'shi-ō vī'sūs*).—An optical illusion.
De facto (*dē fac'tō*).—In point of fact. A legal phrase used to describe that which is fact as opposed to that which is legal.
Dei gratia (*Dē'ī grā'shi-ā*).—By the grace of God. A phrase used in respect to a sovereign, in royal proclamations, and on coins of the realm.
Disjecta membra (*dis-jek'ta mem'bra*).—Scattered remains.
Divide et impera (*dī'vi-dē et im'per-ā*).—Divide and govern.
Docendo discimus (*dō-sen'dō dis'si-mus*).—By teaching we learn.
Dominus providebit (*Dom'in-us prō-vid-ē'bit*).—The Lord will provide.
Dramatis personæ (*drā'ma-tiss per-sō'nē*).—Characters of a play.
Dulce domum (*dul'sē dō'mum*).—Sweetly homeward.
Dulce et decorum est pro patria mori—Horace (*dul'se et de-kor'um est pro pat'ri-ā mōr'ī*).—It is pleasant and befitting to die for one's country.
Dum spiro, spero (*dum spī'ro, sper'ō*).—While I breathe, I hope.
Dum vivimus, vivamus (*vī'vim-us, vī-vā'mus*).—While we live, let us live—*i. e.*, whilst we have life, let us enjoy it.
Durante vita (*du-ran'te vī'tā*).—During life.
Ecce homo! (*ek'se hom'o*).—Behold the man! A name given to representations of the suffering Savior, because Pilate used those words when Christ came forth wearing the crown of thorns and purple robe (St. John xix. 5).
Editio princeps (*e-dish'io prin'seps*).—Original edition.
Emeritus (*ē-mer'itus*).—A soldier who has served his time, a veteran: hence, one retired from active official duties, as an Emeritus professor.
E pluribus unum (*ē plūr'i-bus ū-num*).—From many, one. Motto of United States.
Esse quam videri malim (*es'se kwam vī-dē'rī mā-lim*).—I prefer to be, rather than seem to be.
Esto quod es (*es-tō quod ēz*).—Be what thou art.
Et cetera (*et sē'ter-a*), &c., or etc. And so forth.
E tenebris oritur lux (*ē ten'e-brīs or'i-tur lux*).—Out of darkness there arises light.
Et sequentes (*et se-kwen'tēs*).—And those that follow.
Et sequentia (*se-kwen'shia*)—*et seq.*—And what follows.
Et sic de ceteris (*et sik dē sē'teris*).—And so of the rest.
Et tu, Brute (*tū Brū'te*).—And thou also, Brutus! The words were used by Cæsar when he discovered Brutus among the conspirators who assassinated him in the senate-house, B. C. 44.
Ex æquo (*ē'kwo*).—In like manner, equally.
Ex animo (*an'imo*).—From the soul, heartily.
Ex cathedra (*kath'e-drā*).—From the chair—*i. e.*, with authority. The phrase originally referred to the decisions given by popes and prelates in their pontifical character; it is now used in reference to any decision given with the air of authority.
Exceptio probat regulum (*ex-sep'shio prō-bat reg'u-lum*).—The exception proves the rule.
Ex curia (*kū'riā*).—Out of court. Originally every full Roman citizen belonged to one of the thirty curiæ or divisions of the city, and was entitled to vote on the laws submitted to his curia. The phrase *ex curia* was applied to those who had no right to vote in the curia. It is now used to denote a person who has no *locus standi* before any tribunal.
Ex delicto (*dē-lik'tō*).—From the crime.
Exempli gratia—*e. g.* (*ex-em'plī grā'shia*).—By way of example.
Exeunt (*eks'e-unt*).—They go out. Used by the older playwrights to indicate the departure of some of the performers from the stage.
Exit (*eks'it*).—He (or she) goes out.
Exitus acta probat (*ex'it-us ak'ta prō'bat*).—The event justifies the deed. Motto of George Washington.
Ex nihilo nihil fit (*ex ni'hillo ni'hill fit*).—Out of nothing nothing comes.
Ex officio (*of-fish'iō*).—By virtue of his office: *e. g.*, the president of a society is *ex officio* a member of all committees of the society.
Ex parte (*par'te*).—On one side only. A phrase indicating an application, concerning a pending action, to a judge by one party in the action in the absence of the other.
Experientia docet sapientiam (*ex-pe-ri-en'shia dō'set sap-i-en'shi-am*).—Experience teaches wisdom.
Faber est quisque fortunæ suæ—Sallust (*fab'er est kwis'kwe for-tū'nē sū'ē*).—Every man is the maker of his own fortune.
Facile princeps (*fas'il-e prin'seps*).—Easily the chief—*i. e.*, the admitted chief.
Facilis descensus Averno—Virgil (*fas'il-iss dē-sen'sus av-er'nō*).—The descent to Avernus (or hell) is easy: the downward road is an easy one. Avernus was a lake of Campania, near which was the cave through which Æneas descended to the lower world.
Fac simile (*fak sim'il-e*).—Do the like. An exact copy.
Factotum (*fak-tō'tum*).—Do everything. A man of all work.
Fecit (*fē'sit*).—He did it. Generally affixed to the pedestal of a statue by the sculptor who executed it.
Felicitas habet multos amicos (*fē-lī'si-tas hab'et mul'tōs am-ī'kōs*).—Happiness has many friends: *i. e.*, friends flock around those who are prosperous.
Feræ naturæ (*fer'ē na-tū'rē*).—Of the nature of a wild beast.
Festina lente (*fes-tī'nā len'tē*).—Hasten slowly: *i. e.*, do nothing in a hurry.
Fiat justitia, ruat cœlum (*fī'at jus-tish'i-a rū'at sē'lum*).—Let justice be done, even though the heavens should fall.
Fiat lux (*fī'at lux*).—Let there be light.
Fides Punica (*fī'dēs Pū'nik-a*).—Punic (*i. e.* Carthaginian) faith: treachery. A proverbial expression among the Romans for faithlessness.
Fidus Achates (*fī'dus Akā'tēz*).—The faithful Achates: a true friend. Achates was the distinguished companion of Æneas in his wanderings after his flight from Troy.
Fieri facias (*fī'erī fas'i-ass*).—Cause it to be done. Usually written *fi. fa.* The title of a writ of execution issued to give effect to the judgment of a court of justice.
Finem respice (*fī'nem res'piss-e*).—Look to the end.
Finis coronat opus (*fī'nis korō'nat op'us*).—The end crowns the work.
Flagrante delicto (*de-lik'tō*).—In the act of committing the crime: *i. e.*, in the very act.
Fortes fortuna juvat (*fōr'tēs fortū'na ju'vat*).—Fortune helps the brave.

Fortis cadere, cedere non potest (*for'tiss kad'er-e sē'der-e non pot'est*).—The brave may fall, but cannot yield.
Fortiter et recte (*for'tit-er et rek'tē*).—Courageously and uprightly.
Fortitudine et prudentia (*forti-tu'din-e et prūden'shi-ā*).—By fortitude and prudence.
Fortuna favet fatuis (*fortu'na fav'et fat'uīs*).—Fortune favors idiots.
Fortunæ filius (*for-tu'nē fil'ius*).—A son of fortune—*i.e.*, one favored by fortune.
Fortuna sequatur (*sekwā'tur*).—Let fortune follow.
Frangas non flectes (*fran'gas non flek'tēs*).—You may break, but you shall not bend, me.
Fronti nulla fides (*fron'tī null'a fī'dēs*).—Do not judge by appearances.
Frustra laborat qui omnibus placere studet (*frus'trā labōr'at kwī om'nibus pla-sē're stū'det*).—He labors in vain who studies to please all.
Fugit irreparabile tempus—Virgil (*fū'jit ir-rep-ar-ā'-bil-e tem'pus*).—Time, once gone, can never be regained.
Furor arma ministrat—Virgil (*fū'ror ar'ma min'is-trat*).—Rage supplies them with arms.
Furor loquendi (*fu'ror lo-kwen'dī*).—A rage for speaking.
Furor poeticus (*po-ēt'ik-us*).—Poetical fire.
Furor scribendi (*skrī-ben'dī*).—A rage for writing.
Gaudeamus (*gawdeā'mus*).—Let us rejoice.
Gloria in excelsis Deo (*glor'i-a in ex-sel'sis dē'ō*).—Glory to God in the highest. The opening words of the greater doxology sung in the ancient Church; chiefly used in the Communion service and private devotion.
Gratis (*grā'tiss*).—Free; for nothing.
Gutta cavat lapidem non vi, sed semper cadendo (*gut'ta kav'at lap'id-em non vī sed sem'per ka-den'dō*).—The drop hollows the stone not by force, but by constant falling.
Haud passibus æquis—Virgil (*hawd pass'i-bus ē'kwīs*).—With unequal steps.
Hic et ubique (*hik et ubī'kwe*).—Here and everywhere. ("Here, there, and everywhere.")
Hic jacet (*hik ja'set*).—Here lies. An inscription frequently carved on monuments dedicated to deceased persons.
Hoc age (*hok aj'e*).—Do this.
Homo sum: humani nihil a me alienum puto—Terence (*hom'o sum humā'nī nī'hil ā mē ali-ē'num pū'to*).—I am a man: I count nothing human indifferent to me.
Honesta mors turpi vita potior—Tacitus (*hones'ta maws tur'pī vī'tā pō'shior*).—An honorable death is preferable to a base life.
Honor virtutis præmium (*hon'or virtu'tiss prē'mium*).—Honor is the reward of virtue (or valor).
Humani generis decus (*humā'nī jen'er-iss dek'us*).—The glory of the human race. These words are inscribed on Sir Isaac Newton's monument on the rood-screen in Westminister Abbey.
Humanum est errare (*humā'num est errā're*).—It is human to err. "To err is human, to forgive, divine."—Pope.
Ibidem (*ibī'dem*).—In the same place.
Idem (*ī'dem*).—The same.
Id est (*i. e.*).—That is, that is to say.
Ignis fatuus (*ig'niss fat'u-us*).—A deceiving fire: a Will-o'-the-wisp; an inflammable gas frequently seen over marshes, which leads the traveler who pursues it into the bog.
Ignorantia legis excusat neminem (*ignoran'shia lē'jis excū'sat nem'inem*).—Ignorance of the law excuses nobody.
Imo pectore (*ī'mo pek'tor-e*).—From the bottom of the heart.
Impedimenta (*im-pedi-men'ta*).—The baggage of an army; luggage in traveling.
Imperium in imperio (*imper'ium in imper'io*).—One government within another.
Imprimatur (*imprimā'tur*).—Let it be printed. The term is used to signify the permission to print a book.
Imprimis (*im-prī'miss*).—In the first place, chiefly, especially.
In æternum (*in ēter'num*).—Forever.
In articulo mortis (*ar-tik'ulo mor'tis*).—At the point of death.
In capite (*kap'i-te*).—In chief.
In cauda venenum (*kaw'dā venē'num*).—There is poison in the tail. The sting of the scorpion is at the tip of its tail.
In cœlo quies (*se'lo kwī'ēs*).—There is rest in heaven.
In commendam (*commen'dam*).—In recommendation.
In curia (*kū'ri-ā*).—In the court.
Index expurgatorius (*in'dex expurgator'ius*).—A list of prohibited books. The term employed for the list of books which are allowed to be read after revision by the papal authorities. The I. E. was commenced by Pope Paul IV. (1555), and published by Pope Pius IV. (1559), after organization by the Council of Trent (1545-1563). Press censorship exists in Russia and some other nations.
In esse (*ess'e*).—In being.
In extenso (*exten'so*).—At full length.
In extremis (*extrē'miss*).—At the point of death.
In flagrante delicto (*flā-gran'te delik'tō*).—In the very act.
In formâ pauperis (*for'mā paw'per-iss*).—As a poor man. A law term denoting the status of a person who, having just cause of action, has no money to pay costs, counsel under these circumstances being appointed by the court.
In foro conscientiæ (*for'ō con-shi-en'shi-ē*).—Before the tribunal of conscience.
Infra dignitatem (*in'frā dignitā'tem*).—Beneath one's dignity.
In hoc signo vinces (*in hoc sig'nō vin'sēs*).—Under this standard (sign) thou shalt conquer. Motto of the Emperor Constantine, who first used it on his standard (*labarum*) in the battle against Maxentius, A. D. 312.
In limine (*li-min-e*).—At the threshold.
In loco parentis (*lō'kō paren'tiss*).—In the place of a parent. A law term denoting the guardian who takes charge of a child in the event of the death or mental incapacity of its parents.
In medias res (*med'i-ass rēs*).—Into the midst of things, *e. g.*, to come to the point at once.
In medio virtus (*med'i-o vir'tus*).—Virtue lies in the mean.
In memoriam (*memor'i-am*).—To the memory of.
In nomine (*nom'i-ne*).—In the name of.
In nubibus (*nū'bi-bus*).—In the clouds.
In nuce (*nū'se*).—In a nutshell.
In pace (*pā'se*).—In peace.
In perpetuum (*per-pet'u-um*).—Forever.
In posse (*poss'e*).—Possible.
In præsenti (*prē-sen'tī*).—At present, now.
In propria persona (*prō'prī-ā persō'nā*).—In person. A law term applied to a litigant who conducts his own case.
In puris naturalibus (*pūr'īs naturā'li-bus*).—Stark naked.
In re (*rē*).—In the matter of (legal).
In rerum natura (*rēr'um natū'rā*).—In the nature of things.
In situ (*sī'tū*).—In its original situation.
In statu pupillari (*stā'tū pupillār'ī*).—In the state of being a ward (legal).
In statu quo (*kwō*).—In the state in which it was, we were, etc. (legal).
In tenebris (*ten'e-brīs*).—In darkness.
Inter alia (*in'ter al'i-a*).—Among other things (legal).
Inter nos (*nōs*).—Between ourselves.
Inter pocula (*pō'ku-la*).—At one's cups.
Inter se (*in'ter sē*).—Among themselves.
In toto (*tō'tō*).—In the whole; entirely.
Intra muros (*in'trā mū'rōs*).—Within the walls.
In transitu (*trans'i-tū*).—On the passage.
In vacuo (*vak'u-ō*).—In a space devoid of air.
In vino veritas (*vī'no ver'i-tas*).—There is truth in wine—*i. e.*, the truth comes out under its influence.
Ipse dixit (*ip'se dix'it*).—He himself said it: dogmatic assertion.
Ipsissima verba (*ipsiss'i-ma ver'ba*).—The very words.
Ipso facto (*ip'so fak'to*).—In the fact itself.
Ipso jure (*ip'so ju're*).—By the law itself.
Ira furor brevis est—Horace (*ī'ra fū'ror brev'iss est*).—Anger is a short madness.
Ita lex scripta est (*it'a lex scrip'ta est*).—Thus the law is written.
Jacta alea est (*jak'ta ā'le-a*).—The die has been cast. Famous phrase said to have been used by Julius Cæsar on crossing (49 B. C.) the Rubicon, the sacred boundary of the domestic Roman Empire, by which act he declared war against Pompey and the Senate.
Jure divino (*jū're dīvī'no*).—By divine law.
Jure humano (*humā'no*).—By human law.
Jus civile (*jus sīvī'le*).—The civil law. The term commonly used to describe the Roman law and the various modern systems based upon it, as contrasted with the English common law.
Jus divinum (*dīvī'num*).—The divine law; the law which is right with respect to things divine.
Jus gentium (*jen'shium*).—The law of nations; the law that all nations esteemed to be equitable.
Laborare est orare (*labōrār'e est orār'e*).—To labor is to pray (or Work is worship).
Labore et honore (*labōr'e et honōr'e*).—By industry and honor.
Labor ipse voluptas (*lab'or ip'se vo-lup'tas*).—Labor itself a pleasure.
Labor omnia vincit (*lab'or om'ni-a vin'sit*).—Labor conquers all things.

Lapsus calami (*lap'sus cal'a-mi*).—A slip of the pen.
Lapsus linguæ (*lin'gwē*).—A slip of the tongue.
Lapsus memoriæ (*mem-ōr'i-ē*).—A slip of the memory.
Lares et Penates (*Lār-ēs et Penā'tēs*).—Household gods.
Latet anguis in herba—Virgil (*la'tet an'gwis in her'bā*). —A snake is concealed in the grass.
Laus Deo (*laws Dē'o*).—Praise to God.
Lex non scripta (*skrip'ta*).—The unwritten law—*i. e.*, the common law.
Lex scripta.—The written law—*i. e.*, the statute law.
Lex talionis (*tal-i-ō'niss*).—The law of retaliation.
Lex terræ (*ter'rē*).—The law of the land.
Loco citato—*loc. cit.* (*lok'ō sit-ā'tō*).—In the place quoted.
Locus in quo (*kwō*).—The place in which (legal).
Locus sigilli (*si-jill'i*).—The place of the seal.
Lusus naturæ (*lū'sus natū'rē*).—A freak of nature.
Magna est veritas, et prævalebit (*mag'na est very'tass et prē-val-ē'bit*).—Great is truth, and it will prevail.
Magni nominis umbra (*mag'nī nom'i-niss um'bra*).—The shadow of a great name.
Magnum bonum (*mag'num bō'num*).—A great good.
Magnum opus (*op'us*).—A great work. The chief work of a distinguished author is frequently so called.
Mala fide (*mā'lā fi'dē*).—In bad faith.
Mandamus (*mandā'mus*).—We command: a law writ.
Manibus pedibusque—Terence (*man'i-bus pedi-bus'-kwe*).—With hands and feet—*i. e.*, with might and main.
Materia medica (*mā-ter'i-a med'ic-ca*).—Substances used in medicine.
Mea culpa (*mē'ā kul'pā*).—By my fault.
Medio tutissimus ibis (*med'i-o tū-tiss'imus i'bis*).—The middle is the safest course.
Me judice (*jū'di-se*).—I being judge; *i. e.*, in my own opinion.
Memento mori (*me-men'tō mor'i*).—Remember that you must die. Words used at Egyptian banquets to remind the guests of their mortality.
Memorabilia (*memorabil'i-a*).—Things to be remembered. The name of a work by Xenophon, the Athenian general, historian, and philosopher (*c.* 445-359 B. C.).
Mensa et thoro (*men'sā et thor'ō*).—From bed and board.
Mens conscia recti (*mens con'shia rek'ti*).—A mind conscious of rectitude.
Mens sana in corpore sano (*mens sā'na in kor'por-e sā'no*).—A sound mind in a healthy body.
Meo animo (*mē'o an'im-o*).—In my opinion.
Meo periculo (*per-i'kulo*).—At my own risk.
Meum et tuum (*mē'um et tū'um*).—Mine and thine.
Mirabile dictu—Virgil (*mi-rā'bil-e dik'tū*).—Wonderful to tell.
Mirabile visu (*vi'su*).—Wonderful to see.
Mirabilia (*mi-ra-bil'i-a*).—Wonderful things.
Mittimus (*mit'i-mus*).—We send. A writ by which a culprit is committed to jail. A legal phrase for the writ transferring records from one court to another.
Modo et forma (*mod'o et for'mā*).—In manner and form.
Modus operandi (*mod'us operan'di*).—The manner of operation.
More suo (*su'o*).—In his own way.
Mors janua vitæ (*maws jan'u-a vi'tē*).—Death the gate of life.
Mors omnibus communis (*om'nibus kommū'nis*).—Death is common to all of us.
Mors ultima linea rerum est—Horace (*ul'tim-a li'ne-a rēr'um est*).—Death is the boundary line of all things.
Mos pro lege (*mōs pro lē'je*).—Custom for law (a law phrase).
Motu proprio (*mō'tū prō'priō*).—Of his own accord.
Multum in parvo (*mul-tum in par'vō*).—Much in little.
Mutatis mutandis (*mu-tā'tis mu-tan'dis*).—Things being changed which ought to be changed; *i. e.*, with necessary changes.
Necessitas non habet legem (*necess'it-ass non hab'et lē'jem*).—Necessity has no law.
Ne fronti crede (*nē front'ti krē'de*).—Trust not to appearances.
Nem. con.—abbreviation for **nemine contradicente** (*nem'in-e contra-di-sent'e*).—No one speaking in opposition: without opposition.
Nem. dis.—abbreviation for **nemine dissentiente** (*dis-sen-shi-en'te*).—No one dissenting: without a dissenting voice.
Ne plus ultra (*nē plus ul'trā*).—No more beyond: *i. e.*, perfection.
Ne quid nimis—Terence (*nē kwid nim'iss*).—Not too much of anything; *i. e.*, shun extremes.
Nesoit vox missa reverti—Horace (*nes'sit vox miss'a rever'ti*).—The spoken word cannot be recalled.
Ne sutor ultra crepidam—Pliny (*sū'tor ul'tra crep'i-dam*).—Let the cobbler stick to his last; *i. e.*, let everyone attend to his own business.
Nihil ad rem (*ni'hil ad rem*).—Nothing to the point.
Nullum quod tetigit non ornavit (*kwod tet'i-git non ornā'vit*).—He touched nothing which he did not adorn. These Latin words form part of Dr. Johnson's epitaph on Oliver Goldsmith in Westminster Abbey.
Nil conscire sibi—Horace (*con-sī're sib'ī*).—To be conscious of no wrong.
Nil desperandum.—Never despair.
Nisi Dominus frustra (*ni'si dom'in-us frus'trā*).—Unless the Lord be with us, we strive in vain. Motto of the City of Edinburgh.
Nisi prius (*ni'si prī'us*)—literally, Unless previously. A trial at *Nisi Prius* may be defined as a trial, before a judge and jury, of a civil action that has been brought in one of the superior courts.
Nolens volens (*nō'lens vō'lens*).—Whether he will or not.
Noli me tangere (*nō'lī me tan'jer-e*).—Don't touch me.
Nolle prosequi (*nol'e prō'sek-wī*).—To be unwilling to proceed (legal term). An undertaking by a plaintiff that he will not proceed with part or the whole of his suit.
Non compos mentis (*kom'poss men'tiss*).—Not sound in mind.
Non constat (*kon'stat*).—It does not appear.
Non est inventus (*inven'tus*).—He has not been found.
Non licet (*liss'et*).—It is not lawful.
Non multa, sed multum (*mul'ta sed mul'tum*).—Not many things, but much.
Non obstante (*ob-stan'te*).—Notwithstanding.
Non omnia possumus omnes—Virgil (*om'ni-a poss'-u-mus om'nēs*).—We cannot, all of us, do all things.
Non quo sed quomodo (*kwō sed kwō'mod-ō*).—Not by whom, but in what manner.
Non sequitur (*sek'wit-ur*).—It does not follow.
Non sibi, sed patriæ (*sib'i sed pat'ri-ē*).—Not for himself, but for his country.
Nosce teipsum (*nos'se tē-ip'sum*).—Know thyself. The Latin form of the Greek inscription over the portico of the Temple of Apollo at Delphi.
Noscitur ex sociis (*noss'i-tur ex sō'si-īs*).—He is known by his companions.
Nota bene (N. B.) (*nō'tā bē'nē*).—Mark well.
Novus homo (*nov'us hom'o*).—A new man—one who has raised himself from obscurity. Term applied to men who in the days of the Roman Republic and Empire rose to distinction but did not belong to an ancient *gens*.
Nulli secundus (*null'ī se-kun'dus*).—Second to none.
Nunc aut nunquam (*nunk awt nun'kwam*).—Now or never.
Obiit (*ob'i-it*).—He (or she) died. An inscription on tombs, indicating the fact of the death of the person interred.
Obiter dictum (*ob'it-er dik'tum*).—A thing said by the way, incidentally; plural, **obiter dicta.**
Odium theologicum (*ō'di-um theo-loj'i-kum*).—Hatred among divines. Theological controversy usually provoking great bitterness on the part of the disputants.
Omnia ad Dei gloriam (*om'ni-a ad Dē'ī glor'i-am*).—All things to the glory of God.
Omnia bona bonis (*om'ni-a bō'na bō'nīs*).—To the good all things are good.
Onus probandi (*ō'nus pro-ban'di*).—The burden of proving (legal).
Optimates (*op-ti-mā'tēs*).—Aristocrats. Literally, the best. In ancient times the aristocracy was composed of men selected for their superior vigor as the best in the tribe.
Opum furiosa cupido—Ovid (*op'um furi-ō'sa ku-pī'dō*). —The ungovernable greed for wealth.
Ora et labora (*ōr'ā et lab-ōr'ā*).—Pray and work.
Ora pro nobis (*ōr'ā pro nō'bis*).—Pray for us. The words of the refrain of the well-known hymn in the Roman Catholic mass.
Ore rotundo (*ōr'ē rō-tun'dō*).—With round, full voice.
O tempora! O mores!—Horace (*tem'por-a mor'ēz*).—O the times! O the manners!
Otium cum dignitate (*ō'shi-um kum dig-ni-tā'te*).—Ease with dignity.
Otium sine dignitate (*sin'e*).—Ease without dignity.
Pace tua (*pā'se tū'ā*).—With your permission.
Pacta conventa (*pak'ta con-ben'ta*).—Terms agreed on.
Pari passu (*par'i pass'u*).—With equal pace; in equal proportion.
Pariter pax bello—Cornelius Nepos (*par'it-er pax bell'o*). —Peace is produced by war: *i. e.* by a show of hostile preparations war is often averted.
Particeps criminis (*par'ti-seps krī'min-iss*).—A sharer in the guilt: an accomplice (legal).
Passim (*pas'sim*).—Everywhere.
Pater noster (*pat'er nos'ter*).—Our father. The two first words at the commencement of the Lord's Prayer.
Pater patriæ (*pat'er pat'ri-ē*).—The father of his country. The name given to Cicero by the Roman Senate. The term was also applied to some other distinguished Romans. In later times Andrea Dorea and George Washington were thus distinguished.

Patres conscripti (*pat'rēz kon-skrip'tī*), *i. e.* **patres et conscripti.**—Fathers and elect—the title of the assembled Senate.

Patria cara, carior libertas (*pat'ri-a cār'a cār'i-or lib'er-tas.*).—My country is dear, but liberty is dearer.

Pax in bello (*bell'o*).—Peace in war—*i. e.*, a weak prosecution of hostilities.

Pax vobiscum (*vo-bis'kum*).—Peace be with you.

Peccavi (*pek-kā'vī*).—I have sinned.

Pendente lite (*pen-den'te lī'te*).—While the lawsuit is pending (legal).

Peraget angusta ad augusta (*per-ag'et an-gus'ta ad aw-gus'ta*).—Through difficulties to grandeur.

Per annum.—By the year.

Per centum.—By the hundred.

Per contra.—Contrariwise.

Per diem (*dī'em*).—By the day.

Per fas et nefas (*fass et nef'ass*).—Through right and wrong.

Per mare, per terras (*mar'e ter'ras*).—By sea and by land: *i. e.*, everywhere.

Permitte Divis cetera (*per-mit'e dī'vīs sē'ter-a*).—Leave the rest to the gods.

Per saltum (*salt'um*).—By a leap. A legal phrase frequently used.

Per se.—By itself (legal).

Perseverando (*per-sev-er-an'dō*).—By perseverance.

Petitio principii (*pet-i'shi-o prin-sip'i-i*).—A begging of the question.

Pinxit (*pinks'it*).—He painted it; word placed in the corner of a canvas after the signature of the artist.

Plebs (*pleb's*).—Common poeple. The name given to the third and lowest rank of the orders into which the Roman state was divided.

Pleno jure (*plē'no jū're*).—With full authority.

Pluries (*plū'ri ēz*).—Often, frequently.

Poeta nascitur, non fit—Horace (*po-ē'ta nass'it-ur non fit*).—A poet is born, not made.

Pons asinorum (*ass'in-or'um*).—The bridge of asses (applied to Euclid i. 5).

Posse comitatus (*poss'e com-i-tā'tūs*).—The power of the county. A legal phrase expressing the power of the county or citizens, who are summoned to assist an officer, as the sheriff, in suppressing a riot or executing any legal process.

Post bellum auxilium (*pōst bell'um awx-il'i-um*).—Help after the war.

Postea (*post'e-ā*).—Afterwards.

Post factum nullum consilium (*fak'tum null'um consil'i-um*).—After the deed is done there is no need for consultation.

Post meridiem—P. M. (*mer-ī'di-em*).—After mid-day.

Post mortem.—After death. Term applied to the examination of a body to discover the cause of death.

Post nubila Phœbus (*nū'bil-a fē'bus*).—After clouds the sun shines. Phœbus Apollo, "the radiant Apollo," a god who personified the sun.

Post obitum (*ob'it-um*).—After death. An undertaking given to a usurer to repay a loan on the death of a relative, from whom money is expected, is called a *post obit.*

Post tenebras lux (*ten'e-bras*).—After darkness comes light.

Postulata (*post-u-lā'ta*).—Things demanded.

Prima facie (*prī'mā fā'si-ē*).—On the first view or appearance. A legal term frequently employed to denote that on the evidence already given there is a good case for further investigation.

Primum mobile (*prī'mum mō'bil-e*).—The source of motion; the mainspring.

Primus inter omnes (*prī'mus in'ter om'nēs*).—The first among all.

Primus inter pares (*par'ēs*).—The first among his equals or peers: *e. g.*, an archbishop among bishops.

Principia, non homines (*prin-sip'i-a non hom'in-ēs*).—Principles, not men.

Principiis obsta (*prin-sip'i-īs ob'sta*).—Withstand the beginnings (*i. e.* of evil).

Pro aris et focis (*ar'is et fō'sis*).—For our altars and our hearths.

Pro bono publico (*prō bōnō pub'li-kō*).—For the public good.

Pro et con.—For and against.

Profanum vulgus—Horace (*pro-fā'num vul'gus*).—The common herd.

Pro forma (*for'mā*).—For the sake of form.

Pro hac vice (*hak vi'se*).—For this time.

Pro patria (*pat'ri-ā*).—For our country.

Pro rata (*rā'ta*).—Proportionally.

Pro rege, lege, et grege (*rē'je lē'je et grej'e*).—For the king, the law, and the people.

Pro re nata (*rē na'tā*).—Under the present circumstances, as matters are.

Pro salute animæ (*sal-ū'te an'im-ē*).—For the welfare of the soul.

Pro tanto (*tan'to*).—As far as it goes.

Pro tempore—*pro. tem.* (*tem'por-e*).—For the time being.

Punica fides (*pū'nik-a fidēs*).—Punic (or Carthaginian) faith, *i. e.* treachery.

Quantum (*kwan'tum*).—As much, so much.

Quantum sufficit (*kwan'tum suf-fi'sit*).—As much as is sufficient. A term frequently used in medical prescriptions, as Q. S.

Quasi (*kwā'sī*).—As if, just as, as it were.

Quid nunc? (*kwid nunk*).—What now? What news? Also applied as a name to a person who is always seeking to satisfy his curiosity as to current news.

Quid pro quo (*kwid prō kwō*).—One thing for another.

Quoad hoc (*kwō'ad hok*).—To this extent.

Quo animo? (*kwō an'im-ō*).—With what purpose or intention?

Quod erat demonstrandum—Q. E. D. (*kwod er'at dem-on-stran'dum*).—Which was to be proved. A term used in geometry at the end of propositions, to indicate that the theorem is proved.

Quod erat faciendum—Q. E. F. (*fas-i-en'dum*).—Which was to be done. A term used in geometry at the end of problems, to show that they have been solved.

Quod scripsi, scripsi (*skrip'sī*).—What I have written, I have written. Words used by Pilate when he refused to alter the inscription he had written over the crucified Savior.

Quod vide—*q. v.* (*vī'de*).—Which see.

Quo jure (*kwō jū're*).—By what right.

Quomodo (*kwō-mod-o*).—In what manner, how.

Quondam (*kwon'dam*).—At one time, once, formerly.

Quos Deus vult perdere, prius dementat (*kwōs dē'us vult per'der-e, prī'us dē-men'tat*).—Those whom God has a mind to destroy, He first deprives of their senses.

Rara avis in terris, nigroque simillima cygno—Ovid (*rār'a av'iss in ter'rīs nī-grō'kwe sim-ill'im-a sig'no*).—A rare bird on the earth, and very like a black swan: *i. e.*, a prodigy. This species being almost entirely unknown in the time of the Romans.

Recipe (*res'ip-e*).—Receive.

Recte et suaviter (*rek'tē et swa'vit-er*).—Justly and pleasantly.

Redeunt Saturnia regna (*red'e-unt sat-ur'ni-a reg'na*).—The age of Saturn (*i. e.* the golden age) returns.

Reductio ad absurdum (*re-duk'shi-o ad ab-surd'um*).—A reducing à position to an absurdity.

Rem acu tetigisti (*rem ak'ū teti-gist'ī*).—You have hit the nail on the head (*lit.* touched the matter with a needle-point).

Requiescat in pace—R. I. P. (*rek-wi-ess'kat in pā'se*).—May he (or she) rest in peace. Symbol used on monuments, expressing a prayer for the repose of the soul.

Res gestæ (*rēs jest'ē*).—Exploits.

Res judicata (*jūdi-ka'ta*).—A case or suit already decided.

Respice finem (*res'-piss-e fi'nem*).—Look to the end.

Respublica (*rēs-pub'lik-a*).—The common weal; the commonwealth. Name applied to the Roman state prior to the time of the Empire.

Resurgam (*re-sur'gam*).—I shall rise again. Frequently inscribed on memorials to the dead.

Ride si sapis (*rī' de sī sap'iss*).—Laugh if you are wise; *i. e.*, the wise cultivate a cheerful habit of mind.

Ruat cœlum (*rū'at sē'lum*).—Let the heavens fall.

Rus in urbe (*russ in ur'be*).—The country in town.

Sal atticum (*sal at'tik-um*).—Attic salt—*i. e.*, wit. Salt was used both by the Greeks and Romans as the common term for wit; Attic (*i. e.* Athenian) wit being especially delicate and elegant.

Salus populi suprema est lex (*sal'us pop'u-li su-prē'ma est lex*).—The welfare of the people is the supreme law.

Salve (*sal'vē*).—How are you? I hope you are well. A form of familiar salutation among the Romans.

Salvo jure (*sal'vō jū're*).—Saving the right.

Sanctum sanctorum (*sank'tum sank-tor'um*).—The holy of holies. In ecclesiastical law the chancel of a church is so called; also frequently applied to a private room or study.

Sartor resartus (*sar'tor re-sar'tus*).—The tailor patched. The title of Carlyle's well-known work.

Satis superque (*sat'iss su-per'kwe*).—Enough and more than enough.

Satis verborum (*ver-bor'um*).—Enough of words.

Secundum artem (*sek-un'dum ar'tem*).—According to rule.

Secundum naturam (*na-tūr'am*).—According to nature.

Semper avarus eget—Horace (*sem'per av-ār'us ej'et*).—The covetous man is ever in want.

Semper felix (*fē'lix*).—Always happy.

Semper fidelis (*fid-ē'liss*).—Always faithful.

Semper idem (*ī'dem*).—Always the same. (This is the masculine form; the feminine form is *e'a-dem*, and the neuter *id'em*—all three singular.)

Semper paratus (*par-a'tus*).—Always ready.

Senatus populusque Romanus—S. P. Q. R. (*sen-ā'tus popu-lus'kwe Ro-mā'nus*).—The senate and the Roman people.

Seniores priores (*sen-i-or'ēz pri-or'ēz*).—Elders first. Elderly persons being accorded in ancient times special reverence. Cicero (106-43 B. C.) wrote a work, *De Senectute*, in praise of old age.

Seriatim (*ser-i-ā'tim*).—In a series.

Servabo fidem (*ser-vā'bō fid'em*).—I will keep faith.

Sic (*sik*).—Thus: so. General used ironically to call attention to a literary error.

Sic itur ad astra—Virgil (*sik it'ur ad ass'tra*).—Such is the way to immortality (*lit.*, to the stars).

Sic passim (*pas'sim*).—So everywhere.

Sic transit gloria mundi (*sik trans'it glor'i-a mun'dī*).—Thus passes away earthly glory. Words said to have been used at the inauguration of the early Popes.

Sic vos non vobis—Virgil (*sik vōs non vō'bliss*).—Thus you toil, but not for yourselves. The poet here refers to bees, who make honey, but not for their own use.

Similia similibus curantur (*sim-il'i-a sim-il'i-bus ku-ran'tur*).—Like things are cured by like. Motto of homœopathic school of medicine.

Sine die (*sin'e dī'ē*).—Without a day being appointed: indefinitely.

Sine invidia (*in-vid'i-ā*).—Without envy.

Sine odio (*ō'di-ō*).—Without hatred.

Sine qua non (*sin'e kwā non*).—An indispensable condition.

Siste, viator (*sis'te vi-ā'tor*).—Stop, traveler.

Si vis pacem, para bellum (*sī viss pā'sem par'ā bell'um*).—If you wish for peace, prepare for war.

Sola nobilitas virtus (*sō'la no-bil'itas vir'tus*).—Virtue alone is true nobility.

Sola virtus invicta (*sō'la vir'tus in-vik'ta*).—Virtue alone is invincible.

Spectemur agendo (*spek-tē'mur a-jen'dō*).—Let us be tried by our actions.

Spes mea in Deo (*spēs mē'a in Dē'o*).—My hope is in God.

Spes tutissima cœlis (*spēs tu-tiss'im-a sē'lis*).—The safest hope is in heaven.

Sponte sua (*spon'te su'ā*).—Of one's own accord.

Stat magni nominis umbra—Lucan (*stat mag'nī nom'in-iss um'bra*).—He stands the shadow of a mighty name.

Status quo (*stā'tus kwō*).—The state in which. A legal term indicating the position in which a case stood before certain action was taken in it.

Status quo ante bellum (*an'te bell'um*).—The state in which both parties were before the war.

Stet.—Let it stand—*i. e.*, remain as it was.

Sua cuique voluptas (*sū'a ku-ī'kwe vol-up'tas*).—Every man has his own pleasures.

Suaviter in modo, fortiter in re (*su-ā'vit-er in mod'o for'ti-ter in rē*).—Gentle in the manner, but vigorous in the deed.

Sub judice (*jū'diss-e*).—Under consideration. A legal phrase used to indicate that a case is still under consideration, during which time it is held to be contempt of court to comment upon the case in the public press or elsewhere.

Sub pœna (*pē'nā*).—Under a penalty.

Sub rosa (*rō'sā*).—Under the rose: privately. The rose in ancient times was the emblem of silence, and was used in decorations to show that anything said during the entertainment was not to be divulged. Cupid presented Harpocrates (the god of Silence) with a rose, not to betray the amours of Venus.

Sub silentio (*sil-en'shi-o*).—In silence.

Sufficit (*suf-fi'sit*).—It is enough.

Sui generis (*sū'ī jen'er-iss*).—Of its own kind; *i. e.*, not referable to any particular class.

Summum bonum (*sum'mum bō'num*).—The chief good.

Suo marte (*sū'o mar'te*).—By one's own exertions, without the assistance of others.

Suppressio veri (*sup-press'i-o vēr'ī*).—Suppression of the truth.

Suum cuique (*su'um ku-ī'kwe*).—Let every man have his own.

Tabula rasa (*tab'u-la rā'sa*).—A smooth or blank tablet. From the waxen tablets on which the ancients wrote with a sharp instrument called a *stilus* or style, and with the broad upper end of which writing was erased.

Tanto melior! (*tan'tō mel'i-or*).—So much the better! well done! excellent!

Telum imbelle sine ictu—Virgil (*tē'lum im-bell'e sin'e ik'tū*).—A feeble weapon, thrown without effect.

Tempora mutantur, et nos mutamur in illis (*tem'por-a mū-tan'tur et nōs mū-tā'mur in ill'is*).—The times are changed, and we with them.

Tempus fugit (*fū'jit*).—Time flies. A Latin inscription frequently seen upon sun-dials and old church clocks.

Tempus omnia revelat (*om'nia re-vē'lat*).—Time unveils all things.

Terra firma (*ter'ra firm'a*).—Solid earth; a safe footing.

Terra incognita (*ter'ra in-kog'nit-a*).—An unknown country.

Tertium quid (*ter'shi-um kwid*).—A third something. A logical term.

Toga virilis (*tog'a vir-ī liss*).—The garb of manhood, assumed by Roman youth in their sixteenth year with considerable ceremony, usually at the feasts of Bacchus in March.

Totidem verbis (*tot'id-em ver'bis*).—In just so many words.

Toto cœlo (*tō'tō sē'lō*).—By the whole heavens: diametrically opposite.

Tria juncta in uno (*trī'a junk'ta in ū'no*).—Three joined in one.

Troja fuit (*Trō'ja fū'it*).—Troy was—*i. e.*, exists no longer. Refers to the destruction of Troy by the Greeks (1184 B. C.).

Tu quoque, Brute! (*tū kwō'kwe Brū'tē*).—And thou too, Brutus! When Brutus, the friend and favorite of Julius Cæsar, struck the latter at his assassination, he uttered the words *Tu quoque, Brute!* pulled his toga over his face, and sank, pierced with wounds, at the foot of Pompey's statue.

Ubique (*ub-ī'kwe*).—Everywhere.

Ubi supra (*ub'ī su'prā*).—Where above mentioned.

Ultima ratio regum (*ul'tim-a rā'shi-o rē'jum*).—The last argument of kings. Louis XIV. placed this inscription on his great guns.

Ultima Thule (*ul'tim-a Thū'lē*).—The utmost boundary or limit. *Thule* was an island regarded by the ancients as the most northerly point in the whole earth, and variously supposed to have been Iceland and one of the Shetland group.

Ultimus Romanorum (*ul'tim-us Ro-man-or'um*).—The last of the Romans.

Ultra vires (*ul'trā vī'rēs*).—Beyond one's powers; beyond the rights possessed (legal).

Uno animo (*ū'no an'im-o*).—Of the same opinion.

Usque ad nauseam (*us'kwe ad naw'se-am*).—To utter disgust.

Ut infra (*in'frā*).—As below.

Ut supra (*su'prā*).—As above.

Vade mecum (*vā'de mē'cum*).—Go with me: a constant companion. Title given to medical and other handbooks for convenient reference.

Vale (*valē'*), or **Valeas** (*val'e-ass*).—Farewell, adieu. The usual parting salutation of the Romans.

Valeat quantum valere potest (*val'e-at kwant'um val-ēr'e pot'est*).—Let it pass for what it is worth.

Valete, ac plaudite (*val-ē'te ak plaud'it-e*).—Farewell, and clap. (The concluding words of a Latin comedy.)

Vanitas vanitatum (*van'it-ass van-it-ā'tum*).—Vanity of vanities.

Variæ lectiones (*var'i-ē lek-shi-ō'nēs*).—Various readings.

Variorum notæ (*var-i-or'um nō'tē*).—The notes of various authors.

Varium et mutabile semper femina—Virgil (*var'i-um et mū-tā'bil-e sem'per fē'min-a*).—A woman is ever changeable and capricious.

Velis remisque (*vē'lis rē-mis'kwe*).—With sails and oars—*i. e.*, with tooth and nail, with might and main.

Veni, vidi, vici (*vē'nī, vī'dī, vī'sī*).—I came, I saw, I conquered. By these three words—so easy was the victory—Julius Cæsar informed the Senate of his having defeated Pharnaces near Zela, 47 B. C.

Ventis secundis (*ven'tis se-kun'dis*).—With favorable winds.

Verbatim et literatim (*ver-bā'tim et lit-er-ā'tim*).—Word for word and letter for letter.

Verba volant, scripta manent (*ver'ba vol'ant, scrip'ta man'ent*).—Words fly, writings remain.

Verbum sat sapienti (*ver'bum sat sap-i-en'tī*).—A word is enough to a wise man.

Veritas odium parit—Terence. Truth procures hatred.

Veritas vincit (*very'tass vin'sit*).—Truth conquers.

Versus (*ver'sus*).—Against. A legal term.

Vestigia (*ves-tī'ji-a*).—Tracks; traces.

Vestigia nulla retrorsum (*ves-tī'ji-a null'a ret-ror'sum*).—No steps backward.

Vetera extollimus, recentium incuriosi—Tacitus (*vet'er-a ex-toll'im-us re-sen'shi-um in-ku-ri-ō'sī*).—We exalt the deeds of old, being indifferent to those of recent times.

Vexata quæstio (*vex-ā'ta kwēs'ti-o*).—A much-debated question.

Via (*vī'ā*).—By way of.

Via media (*vī'a med'i-a*).—A middle course.

Vice (*vī'se*).—In the place of.

Vice versa (*vī'se ver'sā*).—The terms being exchanged.

Vide (*vī'dē*).—See.

Vide et crede (*vī'de et krē'de*).—See and believe.
Vide ut supra (*vī'de ut sū'prā*).—See as above; see the preceding statement.
Videlicet—viz. (*vid-ē'liss-et*).—To wit; namely.
Vi et armis (*vi et ar'mis*).—By force and arms—*i. e.*, by main force.
Vincit amor patriæ (*vin'sit am'or pat'ri-ē*).—The love of our country prevails.
Vincit omnia veritas (*vin'sit óm'ni-a very'tass*).—Truth conquers all things.
Vincit veritas (*vin'sit very'tass*).—Truth conquers.
Vinculum matrimonii (*vin'ku-lum mā-tri-mō'ni-i*).—The bond of marriage.
Vindex injuriæ (*vin'dex in-jū'ri-ē*).—An avenger of injury.
Vir sapit qui pauca loquitur (*vir sap'it kwī paw'sa lok'-wit-ur*).—He is a wise man who says but little.
Virtus est vitium fugere—Horace (*vir'tus est vish'i-um fū'jer-e*).—It is virtue to avoid vice.
Virtuti nihil obstat et armis (*vir-tū'tī ni'hil ob'stat et ar'mis*).—Nothing can resist valor and arms.
Virtuti non armis fido (*vir-tū'tī non ar'mis fī'dō*).—I trust to virtue, and not to arms.
Virtutis amor (*vir-tū'tiss am'or*).—The love of virtue.
Vis inertiæ (*viss in-er'shi-ē*).—The power of inertia: passive resistance.
Vivat regina! (*vī'vat rē-jī'na*).—Long live the Queen! The phrase formerly used at the conclusion of royal proclamations.
Vivat rex! (*vī'vat rex*).—Long live the King!
Viva voce (*vī'vā vō'se*).—By the living voice: by oral testimony. That portion of an examination in which the candidate is tested as to his knowledge of the subject by an examiner who personally interrogates him.
Vivida vis animi (*vī'vid-a viss an'im-ī*).—The vigorous strength of intellect: the lively vigor of genius.
Vivit post funera virtus (*vī'vit post fū'ner-a vir'tus*).—Virtue survives the grave.
Vox et præterea nihil (*vox et prē-ter'e-ā ni'hil*).—A voice and nothing more.
Vox populi, vox Dei (*pop'u-lī, Dē'i*).—The voice of the people is the voice of God. Quoted as a proverb by William of Malmesbury, author of "De Gestis Regum Anglorum," twelfth century.
Vulgo (*vul'gō*).—Generally, commonly.
Vultus est index animi (*vul'tus est in'dex an'im-ī*).—The countenance is the index of the mind.

LITERATURE

Literature, in the widest sense, is the record of the impressions made by external realities of every kind upon great men, and of the reflections which these men have made upon them.

VAST RANGE OF LITERATURE

The subject matter of literature covers the whole range of human life and activity, as well as every known manifestation of physical nature. For not only are actual events and the doings and sayings of actual persons reproduced in it, but the rules deduced from the observation of the conditions of man's life are included in its records. Similarly it presents to us not merely what individual men found to interest them in particular countries in a particular epoch, but also the general laws which have been gradually formulated by long-continued observation of the processes of nature.

Literature, therefore, plays a very important part in the life of man. It is the greatest of the secondary sources of knowledge, and it makes an immense contribution to the sum total of facts—the joint result of the experience of the individual and of the race—which gives to each one of us a wide outlook upon the world at large. But we must remember that literature—as literature—is concerned solely with the *subjective* outlook upon the world.

WHY WE STUDY LITERATURE

In order to realize to how large an extent the subjective existence of man is made up of the material of books, we will pause a moment to consider what literature does for us. Through literature we converse with the great dead, with Plato, with Buddha, with Montaigne, with Addison; we walk the streets of Babylon, of Athens, of Rome, of Alexandria; we see great monuments, reared ages ago and long since crumbled to the dust; we recreate the life of distant epochs, and thus by comparison gauge the progress achieved by the men of today. Through literature we learn wisdom from Aristotle, geometry from Euclid, law from Justinian, morality from Christ and St. Paul. Literature makes the physical features, the inhabitants, the climate, the products of the antipodes as familiar as those of the neighboring county.

HOW IT HAS CREATED NEW WORLDS AND PEOPLES

More than this, the masters of creative literature have made regions of their own which they have peopled with the children of their genius. Homer has given us an Ægean of sunlit islands and purple seas; Dante, a dark and mysterious Inferno; Milton, a Garden of Eden; Shakespeare, an Elizabethan England, with landscapes more brightly hued, and men and women more finely real, than the landscapes or the people of the England of Elizabeth; Molière, a France more natural and more vivid than the France of the Grand Monarque. And so it is that Odysseus, Antigone, Beatrice, Hamlet, Tartufe and the rest, these spiritual offspring of great souls, live side by side with Moses, Alexander, Cæsar, Joan of Arc, Henry VIII., and Washington: for literature has made the personalities of each almost as familiar to us as those of our dearest or most intimate friends.

HOW LITERATURE HELPS US INTERPRET LIFE

There is one other important point which must be noticed. It is this: the *subjective* outlook reacts upon the *objective*. The knowledge of the world which we gain through our own previous experiences, and through literature, increases our capacity for understanding the objective world, and heightens and intensifies the pleasure which we derive from the contemplation of works of art or of nature. It is this principle which underlies the truth which Goethe states when he says that a traveler does not take anything out of Rome which he has not first brought into it.

LITERATURE IS THE BRAIN OF HUMANITY

Just as in the individual the brain preserves a record of his previous sensations, of his experience, and of his acquired knowledge, and it is in the light of this record that he interprets every fresh sensation and experience, so the race at large has a record of its past in literature, and it is in the light of this record alone that its present conditions and circumstances can be understood. The message of the senses is indistinct and valueless to the individual without the co-operation of the brain; the life of the race would be degraded to a mere animal existence

without the accumulated stores of previous experience which literature places at its disposal.

BOOKS AS LIBERAL EDUCATORS

So great is the part that books play in our life, or, at least, in the formation of our several personalities, that to master the contents of certain books of admitted excellence has always been considered a chief element in a liberal education; that is to say, it is a recognized method of introducing the mind to the world at large. We must, nevertheless, recognize a broad distinction in the manner in which books render us this assistance. In the case of some books the value of the contribution consists mainly, though not exclusively, in the actual facts which they contain; in others, the actual facts are of secondary importance and their chief value consists in the manner in which these facts are brought before our minds. No hard and fast line can be drawn between the two classes, but the difference may be broadly indicated by saying that while the former give us the *facts* of life, the latter give us *pictures* of life.

The distinction may be illustrated by one or two examples. Such works as Locke's *Essay on the Human Understanding*, and Gibbon's *Decline and Fall of Rome*, must obviously be placed under the head of books in which the facts are of first importance. Equally, the novels of George Eliot, in which she gives us a full and truthful picture of English midland life, must be included among those books where the presentation of the facts is of more importance than the facts themselves. And so, too, in the case of *The Story of an African Farm*, where we have a picture of rural life in South Africa, or in *Diana of the Crossways*. Only in the latter work the personality of the central character is so commanding that the book is not so much a picture as a portrait—a portrait of a beautiful and wayward woman exposed to temptation by the very abundance of her own gifts.

Here, then, we have two distinct elements, matter and manner; and it is upon the degree in which these elements are respectively present in any given work that the main divisions of literature—the division which separates works of creative literature from works of literature, simply so-called—is based.

Poetry, drama, history, biography, essays, description, criticism, the great masterpieces of fiction—all open up to us the untold wealth of reality and imagination.

ENGLISH LITERATURE

The English is the most remarkable as well as the most prolific of modern literatures. Before the Saxons invaded Britain there was a Celtic literature of a rhythmic character, preserved, in the main, orally by the Gaelic and Cymric elements of the population. Gaelic literature is associated with Fionn, Ossian, and the battle of Gabhra, alleged to have been fought A. D. 284, while Cymric literature finds powerful utterance in Aneurin's poem, the *Gododin*, which celebrates the battle of Cattraeth, fought, according to tradition, in the year 570. During the fifth and sixth centuries various Teutonic tribes effected a settlement in Britain, and the island was ultimately subjugated by the Saxons. In the middle of the eleventh century it again suffered conquest at the hands of the Normans. The institutions and language of the conquerors were largely imposed upon the natives, and so great has been the vitality of the Saxon speech that about two-thirds of the words now composing the English language are, radically or derivatively, of Saxon origin.

So, the fabric of English literature is colored with the varying tints of racial characteristics—the somber imagination of the Celt, the flaming passion of the Saxon, the golden gaiety of France, and the prismatic fancy of the South. There have been many influences brought to bear upon its speech; yet, in this composite texture, the Anglo-Saxon element is dominant. That is the first outstanding fact of importance.

THE ANGLO-SAXON PERIOD, 449-1066

The existing remains of Anglo-Saxon literature include compositions in prose and poetry, some of which must be referred to a very early period, one or two perhaps to a time before the Angles and Saxons emigrated to England. Gildas, the author of a Latin treatise on British history, is the precursor of the Anglo-Saxon writers, but the earliest author of real distinction is St. Columbanus, an Irish missionary to western Europe, who wrote religious treatises and Latin poetry, and died in 615.

Cædmon, a monk of Whitby, was the first Anglo-Saxon writer of eminence who composed in his native tongue. Encouraged by the Abbess Hilda, he wrote his *Paraphrase*, in which he discoursed of the Creation and the Fall, and other Biblical themes. His verse was constructed neither in measure nor rhyme, but it was differentiated from prose by a kind of rough poetic alliteration.

The most important Anglo-Saxon poem is that called *Beowulf*, after its hero, extending to more than six thousand lines. This poem may be described as the heathen complement to Cædmon's Christian *Paraphrase*. Beowulf is a Scandinavian prince, who slays a fiendish cannibal, after encountering supernatural perils, and is at last slain in a contest with a frightful dragon. Its scene appears to be laid entirely in Scandinavia. Its date is uncertain; parts of it may have been brought over at the emigration from Germany, though in its present form it is much later than this.

The next great name in the early literature is that of the Venerable Bede, who was born at Jarrow, and became the great monastic teacher of Wearmouth, dying in 735. He wrote numerous works in Latin, the chief of which was his famous *Ecclesiastical History of the Anglo-Saxons*.

Alcuin, a native of northern England and an earnest student and teacher, became the chief intellectual light in the court of Charlemagne. John Scotus Erigena wrote, among other things, a work on the *Division of Nature*, which is regarded as laying the foundation of the scholastic philosophy. King Alfred (901), great in arms and noble and enlightened in character, translated into Anglo-Saxon the histories of Bede

and Orosius, and Boethius's *Consolations of Philosophy*. Other contributions to literature are likewise attributed to him. Ælfric, the grammarian, who died in 1006, wrote his eighty *Homilies* for the use of the common people.

The well-known *Saxon Chronicle* is a survey of early English history, written by various authors. It began soon after the time of Alfred, and continued to the death of Stephen in 1154. Among its entries in verse is a spirited poem on the battle of Brunanburh, fought victoriously by Athelstan against his combined Danish and Celtic foes in 937. Besides the leading writers above cited, there were others of less importance who graced the Anglo-Saxon period—a period embracing some five hundred years from the time of Columbanus to the Norman Conquest.

THE NORMAN-FRENCH PERIOD, 1066-1400

New conditions were imported into the learning and literature of England by the Norman Conquest. Although the Anglo-Saxon Chronicle, referred to above, was continued until 1154, the native language practically ceased for a time to be employed in literature. For nearly a century and a half the old language was supplanted, Latin being employed in law, history, and philosophy, French in the lighter forms of literature. Monastic chronicles were the order of the day, and these were only of real value as they drew near to, and actually dealt with, contemporary events. The Norman *trouvère* displaced the Saxon *scop*, or gleeman, introducing the *Fabliau* and the Romance.

English literature was not greatly influenced by the *Fabliau* until the time of Chaucer; but the Romance attained an early and striking development in the Arthurian cycle, founded upon the legends of Geoffrey of Monmouth, Bishop of St. Asaph, who wrote the *History of British Kings*.

Much of this Latin chronicle is imaginative. It began with a mythical Brutus of Troy, and ended with Cadwallader. King Arthur was a prominent figure in the book, and from this time the romantic legends concerning him and his court became a prominent feature in the Anglo-Norman literature. Geoffrey of Monmouth's *Chronicle* was abridged by Alfred of Beverley, and rewritten in French verse by Geoffrey Gaimar and "Maistre" Wace, the latter version becoming permanent as the *Roman de Brut*. Wace, who died in 1184, was also the author of the *Roman de Rou*.

Walter Map or Mapes, poet and prose writer, gave form and substance to the Arthurian legends, uniting them into a harmonious whole as the spiritual allegory of the Holy Grail. Map attacked the abuses and corruptions of the Church in a series of witty and vigorous Latin poems. Hitherto there had been no man of such genius among the early writers.

Two of the most important of the monastic chroniclers were Ordericus Vitalis, who wrote the *Ecclesiastical History of England and Normandy*, a conscientious if disorderly record, and William of Malmesbury, who flourished at the same time and wrote a *History of English Kings*. The latter writer has been placed by Milton next to Bede.

Early in the thirteenth century English began to recover its position, and Layamon's *Brut* was the first important piece of literature in transition English. Layamon, who was "a priest of Ernleye-upon-Severne," wrote in English verse, and he interpolated many things into Wace's narrative. His work was completed about 1205. A St. Augustine canon, named Ormin, was the author of *Ormulum*, a metrical paraphrase, with expositions, of the Gospel of the day. To the same period belong the early ballads of the Robin Hood type and the rendering into English verse of *Havelok the Dane* and other metrical romances.

Roger Bacon, the great scientific investigator, was a Franciscan who settled at Oxford. Bacon enshrined the results of his knowledge in his *Opus Majus*, *Opus Minus*, and *Opus Tertium*. Robert of Gloucester was a monk in the time of Henry III. and Edward I. who wrote in English rhyme a chronicle from the siege of Troy to the death of Henry III.

Period of Chaucer.—The first great era of English literature may be said to begin about the year 1300, and to extend to the introduction of printing by Caxton in 1477. The overshadowing name in this period is that of Chaucer, who has been styled the Father of English Poetry.

The accounts of Chaucer's early life are uncertain, but he acquired the favor of Edward III. through John of Gaunt. In the reign of Richard II., however, he fell upon evil times, and he died in the year 1400 at the age of seventy-two. His *Canterbury Tales* are immortal, alike for their poetic qualities, their unrivaled delineations of character, and their pictures of the middle-class English life of the period. Although the poet was influenced in his style and choice of subject by Dante and Boccaccio, he infused into his creations a dramatic force and a breath of sympathy which are the characteristics of the highest genius. His earlier and minor poems—such as *The Romaunt of the Rose*, *The Court of Love*, and *The House of Fame*—were the fruit of his French and Italian studies. Hallam classes Chaucer with Dante and Petrarch in the mighty poetic triumvirate of the Middle Ages.

John Gower, next in contemporary importance to Chaucer, wrote the *Confessio Amantis*, an English poem, which included a number of tales that were moralized to illustrate the seven deadly sins.

Langlande, or Longlande, author of *The Visions of Piers Plowman*—a poem which stands out for its graphic force—"sought to animate men to the search for Christ, and battled vigorously with Church corruptions." Langlande is more distinctly English in his language than Chaucer, and his poem was a representative one as showing the workings of the national mind in religion and politics.

James I. of Scotland takes high rank for *The King's Quhair*, and Lawrence Minot for his series of poems on the victories of Edward III. Barbour's heroic poem of the *Bruce* also calls for mention. Thomas Occleve, author of a poem on the duty of kings, and John Lydgate, to whom we owe the *Falls of Princes*, and other compositions, were likewise considerable poets.

For a long period Sir John de Mandeville was regarded as "the father of English prose," but this claim is now abandoned. The larger por-

tion of his *Travels* was borrowed from a worthy Friar Odoric and from other writers, while the whole narrative is more entertaining than veracious. John Wyclif, who gave to his countrymen the first English version of the whole Bible, has been not inaptly styled the "Morning Star of the English Reformation." Sir John Fortescue, Chief Justice in the reign of Henry VI., was the author of a fine legal treatise, *De Laudibus Legum Angliæ*, and of an admirable constitutional work on the *Difference Between Absolute and Limited Monarchy*, in which he contrasted the French rule with the English to the disparagement of the former.

Influence of Caxton.—William Caxton, who introduced the art of printing into England, gave an impetus to literature whose effects have been of incalculable value. The earliest work which can with certainty be maintained to have been printed in England was the *Dictes and Sayings of the Philosophers*, published in 1477. In 1474, however, Caxton had issued at Bruges the first book printed in the English tongue, the *Recuyell of the Historyes of Troye*, and soon after this he printed the *Game and Playe of the Chesse*. Caxton was a most assiduous workman, and produced editions of Chaucer, Lydgate, Gower, and Sir Thomas Mallory's *King Arthur*, translations of Cicero's *De Senectute* and *De Amicitia*, and other works.

William Dunbar, the Chaucer of the North, is placed by Sir Walter Scott at the head of the roll of Scottish poets. Dunbar led a checkered life, and his works are remarkable for their strong human lights and shadows. His allegorical poem, *The Thistle and the Rose*, was written in celebration of the marriage of James IV. with Henry VII.'s daughter Margaret. *The Golden Terge*, another of his poems of fantasy, is very descriptive and rhetorical. *The Dance of the Seven Deadly Sins* powerfully depicts—under the lead of Pride—a procession of the seven deadly sins in the infernal regions. Dunbar was equally remarkable in the comic as in the serious vein.

At the close of the fifteenth century many of the best spirits of the age were drawn to Oxford for the study of Greek. It was taught by William Grocyn and the physician Linacre. Erasmus came over from Paris to acquire it, and while at Oxford he made the acquaintance of young Thomas More, who wrote a defense of the new branch of learning. More afterwards entered upon the thorny paths of statecraft, and paid for his opposition to Henry VIII. with his head. More was the leading prose writer of his time, and his *Life and Reign of Edward V.*—in which he draws a somber picture of the usurper Richard—is the earliest specimen of classical English prose; but his real fame rests upon the *Utopia*, in which he imagines an ideal commonwealth in the New World, discovered by a supposed companion of Amerigo Vespucci. The root idea was borrowed from Plato.

When William Tyndale completed his famous translation of the New Testament in 1525, More adversely criticized it on the ground of its Lutheran bias in the choice of words. Tyndale replied with spirit, however, and also defended against More the exposition of the Lord's Supper published by John Frith. In 1530 Tyndale completed, with the help of Miles Coverdale, his translation of the Pentateuch, and six years later he was put to death for heresy in Belgium. Coverdale's translation of the whole Bible appeared in 1535.

Many Church writers and reformers flourished at this time. To Cranmer was largely due *The Book of Common Prayer*, a work which contains some of the noblest specimens of English in our literature. He was also responsible for a book of *Twelve Homilies* and a revised translation of the Scriptures, known as *Cranmer's Bible*. The martyr Latimer was the author of sermons which are rare specimens of vigorous eloquence, while Bishop Fisher preached and wrote trenchantly on the other side. John Knox, the great Scottish reformer, wrote a *History of the Scottish Reformation*, and he was so indignant at the fact that three ruling sovereigns were women that just before the accession of Elizabeth he issued from Geneva his *First Blast of the Trumpet against the Monstrous Regiment of Women*. John Foxe, the martyrologist did much for Protestantism by his work on the *Acts and Monuments of the Church;* and Roger Ascham, classical tutor to Queen Elizabeth, and author of *Toxophilus* and *The Schoolmaster*, was the first writer on education in the language. Mention must not be omitted here of the unfortunate Earl of Surrey, who was the first writer of blank verse in England, and who did much to invest English poetry with accuracy, polish, and a general spirit of refinement. Surrey used the medium of blank verse in translating two books of the *Æneid*. With his friend, Sir Thomas Wyatt, he also transplanted the sonnet into the garden of English verse.

THE ELIZABETHAN AND PURITAN PERIODS, 1559-1660

The most brilliant, as well as the most virile, era in English literature was that extending from the accession of Elizabeth in 1558 to the closing of the theaters by the Long Parliament in 1648. No other period of ninety years in English history exhibits such a profusion of literary effort and achievement, especially on the dramatic and imaginative sides. The former portion of this period, however, known as the Elizabethan age—but really extending to the middle of the reign of James I.—was the greater in conception. It witnessed not only the rise but the culminating splendor of the drama. Miracle plays or mysteries were the forerunners of the drama. They were acted in churches and convents, and by their dramatic representations of Biblical episodes it was sought to influence the people in favor of virtue.

There was something grotesque, however, in the choice of Satan as the first comedian, while the general treatment of sacred subjects was most objectionable. In course of time the plays changed into moralities, in which abstract qualities such as Justice and Vice took the place of Scripture characters. Next to these, and before the drama proper, came a series of farcical productions, of which Heywood's *Interludes* may be taken as a type.

Edmund Spenser.—One great name interposes between these early plays and the drama, namely, that of Edmund Spenser. He restored the glory of English poetry from the long eclipse it suffered after the death of Chaucer. Spenser's *Shepherd's Calendar* applied pastoral

images to the religious conflicts of the time, and under the name of Algrind he introduced Archbishop Grindal, whose firmness in encouraging free search for Scripture truth he applauded. To his master, Chaucer, the poet paid tribute under the name of Tityrus. In 1590 Spenser published his great but unfinished allegorical epic *The Faerie Queene*, in which he depicted man with all his capacity for good striving heavenwards. The work is "an intense utterance of the spiritual life of England under Elizabeth." Spenser's *Colin Clout Come Home Again* was written in memory of his friendship for Sir Walter Raleigh. The purely poetic qualities were redundant in Spenser, and these have made him a favorite with all his singing brethern since his death.

Sir Philip Sidney has gained a reputation as an English classic for his *Defense of Poesie*, but his romance of *Arcadia* is the more widely known, as it was the more warmly appreciated on its publication. Later critics have censured it, but it is rich and highly finished in its phrases, and "full of fine enthusiasm and courtesy of high sentiment, and of the breath of a gentle and heroic spirit."

Beginning of English Comedy and Tragedy.—The first English comedy, *Ralph Roister Doister*, was written by Nicholas Udall, Master of Eton, between 1534 and 1541. It was avowedly modeled upon *Plautus*, and intended for the edification of Eton boys.

The first tragedy was *Gorboduc*, a new rendering of the old British story of Ferrex and Porrex by Thomas Sackville (Lord Buckhurst), and Thomas Norton. It was acted at the Inner Temple in 1561, and also before the queen by command. It substituted English for Latin in a play constructed after the manner of Seneca, and "its grave dwelling upon the need of union to keep a people strong, a truth of deep significance to England at that time, pleased Elizabeth." But nearly twenty years yet elapsed before the drama obtained a stable hold, and theaters began to be built.

John Lyly, author of the *Euphues*, wrote a number of mythological plays, and George Peele produced *The Arraignment of Paris* and *The Device of the Pageant* in 1584-1585; but Christopher Marlowe, with his "mighty line," was the first great Elizabethan dramatist. His genius was somber, and his tragedies dark and terrible. His *Tamburlaine the Great* was produced in 1587, but his *Doctor Faustus* was not published until ten years after his death, which occurred in 1593.

William Shakespeare.—In the latter part of the sixteenth century began the career of the greatest poet the world has ever seen, William Shakespeare. A period of less than twenty-five years covers the production of all those comedies and histories which are the wonder of modern literature. We marvel what kind of man that could be whose intellect could conceive such widely different works as *A Midsummer Night's Dream, Venus and Adonis, Romeo and Juliet, The Rape of Lucrece*, the famous *Sonnets, The Merchant of Venice, Othello, Macbeth, King Lear*, and *Hamlet*. Shakespeare seems to sum up within himself the whole of poetry and of human philosophy. His power and universality are unique, and will probably ever remain so.

Ben Jonson, the greatest and most scholarly of his contemporaries, wrote from 1596 to 1637; but he lacked the freedom and naturalness of Shakespeare. Beaumont and Fletcher worked in unison with a success rarely attained by collaborators. Massinger was a dramatist of undoubted power, as his *New Way to Pay Old Debts* testifies; and Dekker, Heywood, Marston, and Middleton would all have taken a higher niche in the temple of fame had they lived in a less prolific age. Ford and Webster produced plays of a dark and terrible cast, and the list of Elizabethan dramatists closes with James Shirley who was purer in thought and expression than any of his predecessors. Other poets of this period were Thomas Tusser, who gave an excellent picture of English peasant life in his *Five Hundred Points of Good Husbandry*, and Michael Drayton described this favored isle itself in his *Polyolbion*. The learned John Donne gave utterance to his metaphysical conceits, while Drummond of Hawthornden attested his claim to the title of the finest Scottish poet of his day. Carew, Herrick, and Suckling produced their exquisite lyrics, and Herbert chanted the solemn strains of *The Temple*.

Elizabethan Prose Writers.—The great prose writers of the period must be headed with the illustrious name of Francis Bacon. The father of the inductive philosophy was regarded by those of his contemporaries who knew him best as "one of the greatest men and most worthy of admiration that had been for ages." His adventurous intellect could not be bound by mere tradition. He brought his keen analytical faculty to bear upon the study of man and nature, so that in his matchless *Essays* we have the result of his penetration into the human mysteries, while his philosophy of nature stands revealed in the two books of the *Advancement of Learning*, in which he laid the basis for his *New Organon*.

"Who is there," Burke demands, "that upon hearing the name of Lord Bacon does not instantly recognize everything of genius the most profound, everything of literature the most extensive, everything of discovery the most penetrating, everything of observation of human life the most distinguishing and refined?"

George Buchanan ranks as the Scottish Virgil from the elegance of his Latin verse, while he exhibited equal command over Latin prose Richard Hooker gave a new elevation and dignity to English prose by his *Laws of Ecclesiastical Polity*. Sir Walter Raleigh, the admirable Crichton of his age, carried the English name abroad, but returned only to find imprisonment and the scaffold. He glorified his prison life by the production of his great *History of the World*, which is especially memorable for its vivid recital of the histories of Greece and Rome Camden the antiquary constructed his *Britannia*, and Hakluyt and Purchas indited their wonderful records of travel. James I. threw his ill-digested learning into treatises on Divine Right, Witchcraft, etc.; Burton wrote his quaint and erudite work, *The Anatomy of Melancholy;* Selden, the chief of the learned men of his time, according to Milton, alternated politics with the production of his *Treatise on Titles of Honour* and his *History of Tithes;* Hobbes of

Malmesbury, the terseness of whose style is unique, promulgated his theory of action and morals, as well as his absolutism in politics, in *The Leviathan;* Howell first showed what correspondence might become in his *Familiar Letters*, and genial old Izaak Walton wove an immortal spell over all lovers of good literature by his *Lives of Donne, Hooker*, and others, and *The Complete Angler*. Altogether the age was one eminently full of intellectual life.

THE PURITAN PERIOD.—The decline of the drama, and the end of what we may call the Pagan Renaissance, were contemporaneous with the birth of the great constitutional struggle which began with James I. and did not terminate until the English Revolution.

It is strange that such a time of upheaval should have produced the greatest Christian epic, *The Paradise Lost*, and the greatest Christian allegory, *The Pilgrim's Progress*, which are to be found in any literature. Three great men represented the various forms of the religious struggle going forward; the saintly Jeremy Taylor, a poet among preachers, upheld the cause of Episcopacy; Richard Baxter, while desiring the church discipline and the form of belief, advocated a greater liberty for the individual conscience; and John Milton was a type of the religious freedom and toleration which found best exposition in the principles of the Independents. Milton's *Eikonoklastes* broke down the buttresses of kingly authority; his *Areopagitica* was a noble argument in behalf of intellectual liberty; while his *Paradise Lost, Paradise Regained*, and *Samson Agonistes* were not merely magnificently great as poetry, but Christian evidences of the most sublime type.

John Bunyan, a man of the people, came forward with words that burn and images that enthrall, to show the way from a world of vice to a pure and Holy City. Thomas Fuller, remembering that "blessed are the peacemakers," sought to heal that strife between king and people which was beyond all healing save that of the sword. Some men held themselves aloof from violent controversy while yet maintaining independence of thought—as, for example, Thomas Browne in the *Religio Medici*, published in 1642.

The anti-Puritans had their champions in Samuel Butler, whose fierce wit blazed forth in *Hudibras;* in the great Royalist writer, Clarendon; and in that staunch Royalist and Churchman, Bishop South, whose antipathy to the Nonconformists may be partly condoned by his brilliant wit. Among other writers of the time may be mentioned the versatile Barrow; the powerful satirists Wither, and Bishop Hall; Harrington, the author of the *Oceana;* the patriotic Algernon Sidney, with his admirable *Discourses on Government;* and those garrulous but inimitable chroniclers, Pepys and Evelyn.

The poets were many and varied, including Waller, Davenant, Denham, Marvell, Lovelace, and Cowley.

PERIOD OF THE RESTORATION TO THE RISE OF THE NOVEL, 1660-1740

Extremes always lead to revulsion, and from Puritanism we pass to the licentious court of Charles II., with the songs of Rochester, and the works of Etherege. The comic dramatists of the Restoration and the period immediately succeeding—Wycherley, Congreve, Vanbrugh, and Farquhar—vividly and wittily reflect the glittering life and base morality of the age. One stronger intellect did bring with it for a time the sense of a fresher and diviner air, when John Dryden sang with vigor and insight, and also produced his best comedies and tragedies. Otway likewise showed a momentary gleam of the old Elizabethan dramatic fire. In the sphere of mental and natural philosophy, Locke, Newton, and Boyle grappled with problems hitherto considered unsolvable, and illumined for the world the devious and mysterious paths of scientific inquiry. The selection of names in every branch of English literature, and in every age, can, of course, only be illustrative, not exhaustive.

PERIOD OF DRYDEN AND POPE.—The eighteenth century witnessed a great revolution in English literature, especially on the poetic side. Imagination, passion, and nature were dethroned, and poetry became didactic, philosophical, and political.

Dryden manifested something of the qualities of both schools, but when Alexander Pope arose the new order triumphed. Everything was sacrificed to precision and artificiality.

Pope was the most brilliant and impressive of the new writers. His *Essay on Man* and his *Essay on Criticism* enshrined many old philosophical truths in epigrammatic form. The heroic couplet became in his hands an instrument for cutting diamonds, but the lover of poetry longs after a time to exchange his dazzling couplets for the flowers of poesy. In all that he did, however, whether the work took the form of satires, essays, epistles, or translations, Pope was the finished artist.

The minor poets of Pope's period included John Philips, known by his *Splendid Shilling;* John Gay, the author of the *Shepherd's Week*, and the *Fables;* Samuel Garth, the writer of the mock heroic poem of *The Dispensary;* and Richard Blackmore, who tried to restore the epic in *Prince Arthur*.

Prose literature had many distinguished exponents. Jonathan Swift looms up before us as a gloomy, overshadowing figure, whose saturnine genius found bitter yet powerful expression in *Gulliver's Travels*, the *Battle of the Books*, and the *Tale of a Tub*. His command of English was masterly, but his wit was coarse, his life hopelessly sad, and his death miserable.

Daniel Defoe was not only one of the most vigorous of political pamphleteers, but practically the father of the English novel by his *Robinson Crusoe*, a work which has surpassed almost every other in its uninterrupted popularity. Defoe invested fictitious events with an unapproachable semblance of truth. Metaphysical literature had its best representative in the philosopher Bishop Berkeley, the founder of Idealism in English philosophy; Bernard de Mandeville unfolded a new satirical philosophy in *The Fable of the Bees*, which was intended to prove that the vices of society are the foundation of civilization; and Bishop Butler sought to reconcile reason and revelation by his closely argumentative work, the *Analogy of Religion*.

RISE OF THE ESSAY AND MODERN NEWSPAPER.—A new and interesting form of literary

effort, which popularized letters and criticism, was the periodical essay, instituted by Joseph Addison and Sir Richard Steele.

The latter began the *Tatler*, which dealt in humorous and incisive fashion with the social and political life of the times. Steele was aided by Addison, and they afterwards founded the more famous *Spectator*, which was inimitable in its humor and criticism. The *Guardian* and the *Freeholder* followed, and a higher tone was given to both literature and manners by these admirable publications.

The modern newspaper had its origin in the *Public Intelligencer*, begun in August, 1663, by Sir Roger L'Estrange. The *Oxford Gazette* began in November, 1665, and the *London Gazette* on the 5th of February, 1666. Defoe, while in prison, began the publication of the *Review* (February, 1704).

The drama at the close of the seventeenth century had, besides the greater names already mentioned, Sedley, Shadwell, Mrs. Behn, and Mrs. Centlivre, all of whose comedies, however, were licentious. Nicholas Rowe wrote heavy tragedies, which are no more likely to rise again in popularity than Addison's *Cato*. Foote, Cibber, and Fielding reproduced the follies of the times in their comedies and farces; and the *Beggar's Opera*, by Gay, produced in 1728, was the first specimen of the English ballad opera. Sentimental comedy is associated with Macklin, the Colmans, Murphy, Cumberland, and others; but the two greatest names in English comedy in the eighteenth century are Goldsmith and Sheridan. The delightful humor of *The Good-natured Man* and *She Stoops to Conquer* is only to be matched by the sparkling wit of the *Rivals* and the *School for Scandal*.

Samuel Johnson, born in 1709, began to write in 1744, and from that period until his death in 1784 he was an acknowledged leading power in letters. His *Lives of the Poets*, his *Rasselas*, *The Rambler*, and the great *Dictionary* were remarkable undertakings in various fields; while the world could afford to part with a thousand masterpieces rather than lose that immortal *Biography* by Boswell which has enshrined his master's opinions and conversations. The *Letters of Junius* remind us of the right of criticism over public events and public men, and of the struggle by which the freedom of the press was ultimately won.

RISE OF THE NOVEL AND PERIOD OF ROMANTICISM, 1740-1837

The modern novel of actual life and manners dates from 1740, when Samuel Richardson published his *Pamela*, a story that was the talk and wonder of the town. It was followed by *Clarissa Harlowe*, its author's masterpiece—a book charged with pathos, and instinct with tenderness and morality. Henry Fielding, "the prose Homer of human nature," and, if not so delicate, a more powerful artist than Richardson, issued his *Joseph Andrews* in 1742, and his world-famous *Tom Jones* in 1749. Tobias Smollett wrote his *Roderick Random* in 1748, and this was followed by other stories as realistic as Fielding's but much more marred by caricature. Laurence Sterne's *Tristram Shandy* and the *Sentimental Journey* were novelties in prose writing, and, although they are thin as novels, they will live for their peculiar wit and pathos. Goldsmith's *Vicar of Wakefield*, published in 1766, stands alone for its idyllic beauty and charming simplicity. Fanny Burney's *Evelina* and *Cecilia* were noticeable for invention and observation and skill in portraiture.

The poetry of the second half of the century was varied in character, but it closed with a noble elevation in Burns. To the heavy religious poems of Blair and Young succeeded the more artistic strains of Gray and Collins and Goldsmith, and the mystical yearnings and Elizabethan fervor of Blake. Thomson, one of the most excellent of descriptive poets, had given place to Shenstone, who had less genius but more taste, and a third writer of the Spenserian stanza was found in Beattie. Percy's *Reliques of Ancient English Poetry* brought the ballad again into favor; while Chatterton deceived the very elect by his marvelous imitation of the older forms of poetry.

William Cowper, notwithstanding his fastidiousness and over-refinement, was a poet of a high and genuine order. He let nature have its way in such exquisite poems as the *Lines to His Mother's Picture* and the *Loss of the "Royal George,"* while any humorist might envy the delightful abandonment of *John Gilpin*. His larger poems are severer in style, yet many of their pictures, testifying to a reverent love of nature, remain imprinted on the memory; and they are full of happy phrases and turns of expression.

The new life infused into Scottish poetry was heralded by Michael Bruce, a sweet singer who died at twenty-one, and by Allan Ramsay, whose pastoral drama of the *Gentle Shepherd* affords one of the most beautiful and tender pictures of Scottish rural life. The ballad acquired a new pathos and interest in such productions as Lady Anne Barnard's *Auld Robin Gray*.

But the poetic genius of Scotland found its ripest and fullest expression in Robert Burns. His love songs have the freshness and fervor of the Elizabethan lyrics; his poems of man and of nature, like those of Cowper, reveal the highest aspirations for the welfare of humanity; his humorous compositions are as lifelike in their character-painting as they are full to overflowing of fun; and his serious poems reveal a pathos which has never been excelled. Nature seemed to put on new beauties when Robert Burns chanted her praises, and the daisy can never again seem commonplace since he immortalized it. The poor at length acquired their laureate in this sweet singer of the North.

Historical and philosophical literature attained a high level at this period. Edward Gibbon, though lacking human sympathy, had great creative power and originality, and his *Decline and Fall of the Roman Empire* is one of the most massive of historical conceptions, worked out with stately eloquence. David Hume, whose *History of England* does not take such high rank, was more original in his philosophical speculations, referring all actual knowledge to experience, and making utility the standard of virtue.

Adam Smith, by his *Wealth of Nations*, established his claim to be regarded as the founder of the modern system of political economy, and one of the benefactors of his

species. All questions of labor and capital were placed by this work on a scientific basis, and it paved the way for the doctrine of free trade.

Edmund Burke's *Reflections on the French Revolution* caused a revulsion of feeling against France, while his *Letters on a Regicide Peace* increased the war fever in England. The former work was answered by Thomas Paine in his *Rights of Man*, and the latter by Sir James Mackintosh in his *Vindiciæ Gallicæ*. Burke's philosophical works are models of eloquence and construction. William Paley, in his *Evidences of Christianity* and other works, skillfully defended revealed religion against the attacks of its enemies.

Towards the close of the century the newspaper press received a strong impetus by the establishment of *The Times* and other important journals; knowledge likewise began to be condensed and methodized in Cyclopædias; while criticism took a wider as well as a more popular range in the first decade of the nineteenth century by the foundation of the *Edinburgh* and *Quarterly Reviews*.

We cannot pass from the eighteenth century without noticing the remarkable development in hymnology. George Wither issued the earliest English hymn-book in 1623, *Hymns and Songs of the Church;* but the first hymn-book of the modern type was published by John Wesley for use in the Church of England in 1737. Among the hymnologists of the eighteenth century whose compositions remain in general use until this day may be mentioned A. M. Toplady, John Newton, the Wesleys, Isaac Watts, William Cowper, and Philip Doddridge.

Romanticism and the Early Nineteenth Century.—The literature of the nineteenth century is almost overwhelming in its magnitude and variety. In nearly every branch it has attained a higher level than in the preceding century, and in nothing is this more noticeable than in poetry. Although the century opened when Crabbe, the reporter of rural life, was painting his Dutch-like pictures, we soon pass on to higher things. There was a great revival in imaginative poetry before 1820.

Byron, with his precociousness in love and genius, took a high flight in his *Childe Harold*, and although all his works—*Don Juan, Manfred, Cain*, etc.—were impressed by his own gloomy personality, he yet made living verse.

Shelley, imbued with revolutionary ideas and aspirations after an ideal being, was one of the greatest poets of the age, now Miltonic in his elegiac verse in *Adonais*, and now unapproachable in his lyrics. No singer has ever drawn deeper from the wells of poetic inspiration.

Wordsworth, contemplative and philosophic the patriarch of the Lake School, taught the dependence of the poet on nature, and from the *Lyrical Ballads* to the *Excursion* he illustrated his own saying in his works, that "poetry is emotion recollected in tranquillity." He threw off the conventional, and endeavored to pierce to the heart of things, whether in man or in nature.

Fancy and imagination were made perfect in the exquisite creations and sensuous verse of Keats; wit and pathos abounded in Thomas Hood; while historic and romantic poetry found notable exemplars in Southey, Scott, Rogers, Campbell, and Coleridge. Hannah More and Joanna Baillie sought to galvanize the classical drama; Cunningham sang his Scottish songs; and Keble consecrated sacred hopes in the *Christian Year*.

The historic novel was made memorable by Sir Walter Scott, whose extraordinary fecundity was the wonder of his generation. His novels were the first and greatest prose result of the revived spirit of romanticism. Jane Austen did for the domestic novel what Scott did for the historical. The pictures of English life in *Pride and Prejudice, Mansfield Park*, and the remaining stories by this writer, have never been excelled. Her painting of manners was exquisite, and while her characters and incidents were of the most every-day description, she lifted them out of the commonplace by her exquisite touch and her absolute truthfulness to nature.

THE VICTORIAN PERIOD TO THE PRESENT, 1837- ——

The Victorian age may justly be called great in history, philosophy, biography, fiction, and poetry. Macaulay, in the earlier half of the Victorian period, illumined history by the brilliant glow of his imagination; while in the latter half Carlyle was not only his equal in history, but the first man of letters of his time. In his prose epic, *The French Revolution*, there was the vigor of a Rembrandt; biography was ennobled by his *Cromwell;* while throughout all his works—from *Sartor Resartus* to the latest of his utterances—he upheld the dignity of labor, and the sacredness of duty.

English history in all periods, and the progress and growth of the constitution, found brilliant chroniclers or scholarly interpreters in Hallam, Freeman, Froude, Green, Stubbs, Brewer, and Gardiner; while the philosophical aspects of history have been vividly presented by Buckle and Lecky. Rome lived again in the pages of Merivale; the Jewish race in those of Milman; and Greece in those of Grote and Thirlwall.

Turning to philosophy and science, John Stuart Mill exercised a profound influence upon the age as metaphysician, logician, politician, and moralist. Charles Darwin revolutionized scientific thought by promulgating the theory of evolution, which Herbert Spencer, its most conspicuous philosophical exponent, applied to psychology, morals, and politics. Logic and science had other exponents in Brewster, Whately, Bain, Hugh Miller, John Tyndall, T. H. Huxley, T. G. Tait, and W. K. Clifford. John Ruskin has eloquently wedded art and morality, while biography and criticism have found representative writers in Lockhart, Forster, De Quincey, Masson, Arnold, "Christopher North," Lewes, Helps, Trevelyan, John Morley, and others. Religious thought was deeply impressed by the school of religious literature which arose with the Oxford movement. In poetry, its greatest result was Keble's *Christian Year*, while its greatest product in prose was the beautiful and haunting style of Cardinal Newman, best shown in his *Apologia*.

Pusey, Arnold, Maurice, Robertson, Stanley, Liddon, Martineau, Gladstone, Spurgeon, and many more of all creeds contributed in a lesser degree.

ALFRED TENNYSON'S BEAUTIFUL "LADY OF SHALOTT"

From the exquisite painting of J. W. Waterhouse, who has interpreted for us in flesh and blood Tennyson's far-famed Poem. This is the dramatic moment when the curse is falling upon the lady of the silent isle.

The literature of fiction was suprising in its growth, and practically limitless in its variety. Thackeray showed to what a pitch of literary excellence and finish the novel might attain, and also demonstrated its power as a moral scourge. Dickens, the Hogarth of modern novelists, evoked smiles and tears in myriads of homes by his vivid pictures of life; and George Eliot reflected much of the sadness and unrest of the time in her searching and minutely conscientious works. Charlotte Brontë uttered a passionate note on behalf of her suffering sisters; and Mrs. Gaskell proved herself a genuine artist in the delineation of human life.

Of later women writers, mention must be made of Mrs. Oliphant, Miss Braddon, Mrs. Henry Wood, and "Ouida"—all different in style, yet all equally prolific. Marryat, James, Ainsworth, Warren, and others still find readers.

Charles Kingsley struck a sympathetic human note in his fictions; Anthony Trollope was the most interesting even of all his brethren; Wilkie Collins was a master of mystery; Richard Jefferies was the interpreter of nature; Charles Reade was an intense moral reformer; George Meredith has delighted and puzzled his admirers by his brilliant powers and genius; Lord Lytton is still read for two or three of his healthiest works; and Lever and Lover for their rollicking Irish wit.

It would be invidious to attempt to give a catalogue of all contemporary novelists worthy of mention; but in addition to those already mentioned the names will occur of R. D. Blackmore, Thomas Hardy, Robert Buchanan, George Macdonald, and William Black—all widely different in their gifts and work, but all imbued with a sense of the dignity of the novelist's art. Newer writers of imaginative and adventurous fiction have sprung up in Hall Caine, J. M. Barrie, Rider Haggard, R. L. Stevenson, and Rudyard Kipling.

Tennyson and Other Poets.—In poetry two names stand out above the rest through the Victorian age. Tennyson, the most artistic of all poets, deservedly occupies the first place from the breadth of his range. His lyrics are the finest since Shelley; his *Idylls of the King* deserve the name of epic poetry; his dramas are finely conceived; and his *In Memoriam* sums up the religious aspirations of the time.

Robert Browning, massive and profound in thought, was of all modern poets the most full of pith, energy, and moral aspiration. Mrs. Browning may well be called the daughter of Shakespeare, for never did poet play more divinely upon the Æolian harp of the human heart. Walter Savage Landor exhibited the classical spirit, and Matthew Arnold had an unbroken elevation in his verse. Swinburne is a master of music and rhythm, Rossetti is a perfect artist in construction, while William Morris is a Spenserian singer cast upon a later age.

Among later poets of undoubted gifts are Alfred Austin, William Watson, Clough, Christina Rossetti, Coventry Patmore, and Sir Lewis Morris.

The dramas of Talfourd, Sheridan Knowles, R. H. Horne, Lord Lytton, and Sir Henry Taylor exhibited striking but widely varying merits.

The minor poetic singers and writers of fugitive verse of both sexes are too numerous for particularization.

SUMMARY OF ENGLISH LITERATURE

Note.—Titles of words in *italics* indicate that they are poetic or dramatic.

I. THE ANGLO-SAXON PERIOD, 449-1066

Author and Dates	Representative Works	Literary Characteristics
Unknown 700	*Traveller's Song*	Illustrates the sentiment of a wandering singer and the Anglo-Saxon's love of home.
Unknown	*Beowulf*	An epic song, illustrating the powerful imagination of the race.
Unknown 700-1154	Anglo-Saxon Chronicle	Contains in addition to historical data, one or two war-songs: Battle of Malden, etc.
Caedmon 600-?	*Paraphrase of Scripture*	Showing how strong an appeal the Bible Story made to the reverence of the race.
Bede 673-735	Ecclesiastical History; *Poems*	Inspired by early Christian sentiment.
Unknown 710-?	*Judith*	Paraphrase of Bible narrative.
Cynewulf 750-?	*Poems*	Serious poems of moral simplicity and power.
Alfred the Great 849-901	*Translations*	Some original matter interpolated, e. g., narrative of Othere, versified by Longfellow.
Alcuin 735-804	Letters, Biographies; *Crist, Elene Andreas, etc.*	Friend of Charlemagne. Wrote a comparatively pure Latin.
Ælfric 955-1020	Homilies, Grammar	Writings in Latin; a man of power and sincerity.

II. THE NORMAN-FRENCH PERIOD, 1066-1400

William of Malmesbury 1095-1142	History of Kings of England.	Of some value as an original.
Goeffrey of Monmouth 1154	History of English Kings	Largely legendary. The stories are rehashed in subsequent authors down to Spenser, Shakespeare and Milton.

SUMMARY OF ENGLISH LITERATURE—Continued

Author and Dates	Representative Works	Literary Characteristics
Wace, Richard 1112-1184	*Romance of Rollo; Brut d'Angleterre*	In reality a French trouvere though a subject of the King of England. First mention of Arthur's Round Table.
Mapes, Walter 1143-1210	De Nugus Curialium; *Queste de Saint Graal, etc.*	First mention of the Holy Grail.
Layamon 1150-1210	*Chronicles of Britain*	A devout priest and the first to make the new English a literary medium.
Orm 1187-1237	*Ormulum (paraphrase)*	Also English. Some of the homilies are simple and touching expressions of devotion.
Bacon, Roger 1214-1294	Natural Science Philosophy	A man in advance of his age, he is said to have anticipated Francis Bacon in making experiment the basis of knowledge.
Gloucester, Robert of 13th Century	*Chronicle of England*	Valuable for giving outlines of history of Norman England.
Mandeville, Sir John 1300-1371	Travels	Possibly a pen-name. His travels are an extraordinary farrago of invention and report.
Barbour, John 1316-1395	*The Bruce*	Spirited and patriotic, loved by true Scotchmen.
Langland, William 1330-1400	*Piers, the Plowman*	Extraordinary man of broad humanity. First expression of the voice of the poor.
Wycliffe, John 1324-1384	Translation of Bible	A man of great power and sincerity. A philosopher and scholar.
Gower, John 1325-1408	*Ballads; Lover's Confession*	Friend of Chaucer. A voluminous poet, not of high rank.
CHAUCER, GEOFFREY 1330-1400	*Canterbury Tales; Short poems*	A scholar. A poet of chivalry and a witty narrator of stories in verse. Introduced French and Italian metres. Equally eminent in description and characterization.
III. ENGLISH PERIOD TO THE TIME OF ELIZABETH, 1400-1559		
James I. of Scotland 1394-1437	*The King's Quhair, (Choir, etc.)*	A decided poetic talent in the chivalric fashion.
Malory, Sir Thomas 1430	*Morte d'Arthur*	Worked over a large part of the Arthurian legends in prose. The original for Tennyson's "Idylls of the King."
Caxton, William 1422-1492	The Game of Chess; Translation of the Æneid.	Introduced the Art of printing, brought out Malory's book and made and published many translations and adaptations.
Dunbar, William 1460-1530	*Thistle and Rose; Golden Terge*	The Scotch Chaucer; much inferior to Chaucer and less of a popular poet.
More, Sir Thomas 1478-1535	Utopia, Life of Edward V	A man of fine character. "Utopia" first written in Latin and translated into nervous English. Plan suggested, perhaps, by Plato's "Republic."
Tyndale, William 1484-1536	Translation of Bible	On his translations of the Scriptures, later versions are founded.
Wyntoun, Andrew 15th Century	*Chronicle of Scotland*	Story of Wallace. Much admired by Walter Scott.
IV. THE ELIZABETHAN AND PURITAN PERIODS, 1559-1660		
Wyatt, Sir Thomas 1503-1542	*Sonnets and Lyrics*	Introduced with Howard the Italian forms; sonnet and madrigal, made Italian literature a new force in England.
Howard, Henry, Earl of Surrey—1517-1547	*Translation of the Aeneid; Songs and Sonnets*	Introduced Italian forms and blank verse.
Foxe, John 1517-1587	Book of Martyrs	His book had great influence in strengthening the reformers and was one of the literary influences on the Puritans who came to America.
Sackville, Thomas 1536-1608	*Mirror for Magistrate*	A poet of force and imagination. Afterwards, as Lord Buckhurst, a courtier and politician, worked in collaboration with others and had a hand in first English Tragedy.
SPENCER, EDMUND 1552-1599	*Faerie Queen; Shepherd's Calendar*	Called the "poet's poet." Great in romantic allegory, the ode, and the sonnet.
Raleigh, Sir Walter 1552-1618	History of the World	A politician and adventurer; friend of Spenser. Some fine passages in his work.
Hooker, Richard 1553-1600	Ecclestical Polity	His prose has dignity and force. His book is the authority for the Church of England.
BACON, FRANCIS 1561-1626	Essays, Novum Organum	Many beautiful and acute things in his essays and his philosophical works.
SHAKESPEARE, WM. 1564-1616	*Dramas, Sonnets, (37 plays)*	Compounded of all writers best: wit, humor, characterizations, philosophy, musical phrase, power and construction.
Chapman, George 1559-1634	*Translation of Homer*	Full of vigor and verve, especially his Homer.
JONSON, BEN 1574-1637	*The Alchemist; Sejanus; Timber, etc.*	A scholar and literary man. A learned constructor of plays, had also the true lyrical faculty.

SUMMARY OF ENGLISH LITERATURE—Continued

Author and Dates	Representative Works	Literary Characteristics
Beaumont, Francis 1584-1616	*Dramas: Philaster; Maid*	Well constructed plays but of a decidedly low moral tone. Beaumont is supposed to have been the more promising but died before Fletcher, who continued to produce plays alone, about forty.
Fletcher, John 1579-1625	*Tragedy: Woman Hater; etc.*	
Burton, Robert 1577-1640	Anatomy of Melancholy	Full of out-of-the-way learning and quotations bearing on the subject.
Herbert, George 1593-1633	*The Temple, etc.*	Animated by a devotional spirit and an aesthetic spiritualism.
Herrick, Robert 1591-1674	*Poems*	Lyrics, many of them of charming quality and ingenious construction.
Walton, Izaak 1593-1683	The Compleat Angler	Prose of a delightful character, full of simple piety and love of our-door nature.
Fuller, Thomas 1608-1661	Church History of England, etc.	A chronicle, with passages of wit or natural pathos.
MILTON, JOHN 1608-1674	Areopagitica; *L'Allegro and Il Penseroso; Comus; Paradise Lost; Paradise Regained, etc.*	A poet, grave, learned, of mental dignity but gifted with musical power as much as Shakespeare.
Taylor, Jeremy 1613-1667	Holy Living, etc.	The "Shakespeare of Divines." Passages of rare poetic beauty and organ-like volume.
Baxter, Richard 1615-1691	Saint's Rest	One of the "Vade mecums" of the later Puritans. Earnest and sincere.
V. PERIOD OF THE RESTORATION TO THE RISE OF THE NOVEL, 1660-1740		
BUNYAN, JOHN 1628-1688	Pilgrim's Progress; Holy War.	Simple, idiomatic, with passages of rare beauty. Animated by simple, natural piety. A classic too much neglected.
Butler, Samuel 1612-1680	*Hudibras*	A rhyming jingle, destitute of elevation but with here and there a witty couplet. Anti-Puritan throughout—favorite book of Charles II.
DRYDEN, JOHN 1631-1700	*Virgil Translated; St. Cecilia's Day, etc.*	A fine critic. The father of fluent prose. Many energetic lines of verse, especially in his satires. A man of fine talent but limited genius.
Pepys, Samuel 1633-1703	Diary	His Diary, not intended to be public, throws light on the life and habits of a capable business man of the 18th century.
LOCKE, JOHN 1632-1704	On Human Understanding; Essays; Thoughts on Education, etc.	A sound, practical thinker, whose works illustrate the common sense and unspiritual tone of his age.
Newton, Sir Isaac 1642-1727	Principia, etc.	A great mathematician, he laid the foundation of our understanding of the mechanical structure of the universe.
Defoe, Daniel 1661-1731	Robinson Crusoe	A born story-teller and pamphleteer.
Swift, Jonathan 1667-1745	Tale of a Tub; Gulliver's Travels	Unequalled as a satirist, and writer of allegories, in simple, nervous, idiomatic English.
Steele, Sir Richard 1672-1729	Essays (established the Tatler)	A good second to Addison.
Addison, Joseph 1672-1719	Essays in The Tatler and The Spectator	Originator of the Social essay marked by kindly, gentlemanlike humor in the urbane style.
Berkeley, Bishop 1684-1753	Philosophy	A very acute thinker, English founder of one form of idealism.
Young, Edward 1683-1765	*Night Thoughts*	Rather a ponderous poet, on semi-doctrinal subjects.
POPE, ALEXANDER 1688-1744	*Essays on Man, etc.*	The model poet of his time and century. Used the decasyllabic couplet almost exclusively, but imparted to it vigor, pungency, and some variety.
Butler, Bishop 1692-1752	Natural and Revealed Religion	The orthodox moralist of his day, ponderous in style and commonplace in method.
Carey, Henry 1700-1743	*Sally in our Alley, etc.*	A light gift of doggerel satire.
Thompson, James 1700-1748	*The Seasons, etc.*	A delicate feeling for the quieter aspects of nature, harmoniously expressed.
VI. RISE OF THE NOVEL AND PERIOD OF ROMANTICISM, 1740-1837		
Richardson, Samuel 1689-1761	Clarissa Harlowe; Pamela; Sir Chas. Grandison	Sentimentally moral, but gifted with the story-telling faculty.
FIELDING, HENRY 1707-1754	Tom Jones; Amelia; Jonathan Wild, etc.	Depicts life broadly and faithfully. The first great realistic novelist.
Johnson, Samuel 1709-1784	Dictionary; Rasselas; Lives of the Poets	A man of eighteenth century learning and letters. The critical authority of his day.
HUME, DAVID 1711-1776	History of England	The first learned historian of England. A philosopher of acumen.
Sterne, Laurence 1713-1768	Tristram Shandy; Sentimental Journey	A writer in whom affectation becomes an art. Some pathetic passages have become classic.

SUMMARY OF ENGLISH LITERATURE—Continued

Author and Dates	Representative Works	Literary Characteristics
Gray, Thomas 1716-1771	*Elegy in Country Churchyard, etc.*	A scholar-poet. Production limited, but of fine workmanship.
Smollet, T. George 1721-1771	Humphrey Clinker, Roderick Random, etc.	Originator of the Sea-Story. Inclined to vulgar coarseness.
Akenside, Mark 1721-1770	*Pleasures of the Imagination.*	A man of scholarship and culture, who wrote poetry without a decided gift.
Smith, Adam 1723-1790	Wealth of Nations	The first great economist. The moderns hardly equal to him in natural keenness of insight.
Goldsmith, Oliver 1728-1774	Vicar of Wakefield; Essays; *She Stoops to Conquer; Deserted Village, etc.*	A true and graceful touch both in prose and poetry. Makes hack-work literature. Supposed to be the original compiler of "Mother Goose's Melodies."
Blackstone, Sir William 1723-1780	Commentaries on Laws of England	Learned and careful, with a conception of the dignity of law.
Burke, Edmund 1729-1797	Essays, Orations	Prose, sometimes musical and poetical and at the same time, a statesman's grasp of principle.
GIBBON, EDWARD 1737-1794	Decline and Fall of Roman Empire	A pains-taking and learned historian. Constructive powers of broad scope.
Boswell, James 1740-1795	Life of Samuel Johnson	The true reporter's instinct for the point of a story. Otherwise, a toady.
COWPER, WILLIAM 1731-1800	*The Task; John Gilpin; etc.*	Divests poetry of the affectations of Pope. Writes on simple themes.
Paley, William 1743-1805	Evidence of Christianity, Natural Theology	A cogent reasoner on the old premises.
More, Hannah 1745-1833	Coelebs in Search of a Wife; *Sacred Dramas*	Something of a minor poet, something of a dramatist and story-teller.
Sheridan, Richard B. 1751-1816	Speeches; The Rivals; School for Scandal; Song; etc.	Writer of witty dialogue and constructor of telling stage situations. Comedies still acted.
BURNS, ROBERT 1759-1796	*Cotter's Saturday Night, etc.*	Lyrics, songs and satires in Scotch dialect, marked by music, pathos and wit.
Edgeworth, Maria 1767-1849	Popular Tales, etc.	Stories of middle-class domestic life of excellent moral tone and some power of characterization.
WORDSWORTH, WM. 1770-1850	*The Excursion; Poems*	Nature poems and descriptive poems. Many fine sonnets. First expression of modern feeling for nature.
Hogg, James 1770-1835	Shepherd's Calendar; *Pastorals*	Scotch verses. One or two lyrics of sweetness and simplicity.
Montgomery, James 1771-1854	*Hymns, Poems*	A man universally esteemed; best remembered now for his hymns of which some hundred are found in our Hymnals.
SCOTT, SIR WALTER 1771-1832	Waverly Novels, etc; *Lady of the Lake, etc.*	Originator of the historical novel. Tone natural and wholesome. Secure in the estimation of posterity.
Smith, Sidney 1771-1845	Sermons, Essays, etc.	A witty divine. Master of the expository style.
Coleridge, Samuel T. 1772-1834	Essays; *Rhyme of Ancient Mariner, etc.*	A man of remarkable gifts, both intellectual and poetic; a natural master of verbal melody.
Southey, Robert 1774-1843	Biographies of Nelson, Wesley; *Poems, etc.*	A man of industry and worth. Better as a prose stylist than a poet.
Lamb, Charles 1775-1834	Essays of Elia, etc	A quaint and delicate essayist—friend of Coleridge.
Landor, Walter Savage 1775-1864	Imaginary Conversations, etc; *Count Julian; Heroic Idyls, etc.*	Classic scholar and writer. Reactionary and old-fashioned in his thought but a remarkable stylist.
Austen, Jane 1775-1817	Pride and Prejudice, Emma, etc.	Her novels depicting upper middle-class life are delightfully realistic and full of quiet life.
Porter, Jane 1776-1850	Scottish Chiefs, Thaddeus of Warsaw	Novels in an antiquated style of exaggerated romance.
Campbell, Thomas 1777-1844	*Pleasures of Hope, Lyrics, etc.*	Something of a critic, his lyrics have much vigor and verve.
Hallam, Henry 1777-1859	Europe during Middle Ages, Introduction to Literature, Constitutional History of England	Strong, vigorous, historical writing from a standpoint now antiquated.
Hazlitt, William 1778-1830	Table Talk, English Poets, etc.	Critical essays; contain some true eloquence, and many powerful phrases.
Moore, Thomas 1779-1852	Biographies; *Lalla Rookh, Irish Melodies, etc.*	Songs of much melody, but of an unreal sentimentality.
DeQuincey, Thomas 1785-1859	Confessions of an Opium Eater, etc.	Passages of magnificent color. A learned man, lacking in sound realistic judgment.
Hunt, Leigh 1784-1859	Essays, Sketches, Memoirs; *Poems*	A minor poet. A litterateur of appreciation rather than of creative power.
Wilson, John 1785-1854	Noctes Ambrosianae, etc.; *Poems*	A virile man. As a writer, "of his age, not for all time" nor indeed for an entire century.

SUMMARY OF ENGLISH LITERATURE—Continued

Author and Dates	Representative Works	Literary Characteristics
Peacock, Thos. L. 1785-1866	Crotchet Castle, Rododaphne, etc.	A litterateur, novel writer, and verse writer of wit and epigrammatic power but no constructor.
Byron, Lord 1788-1824	*Poems*	Vigorous, eloquent, sardonic, iconoclastic, lacking in divine sympathy. A great satirist, and in many regards a great poet.
SHELLEY, PERCY BYSSHE—1792-1822	*Queen Mab, Adonais, The Sky Lark, etc.*	A remarkable gift of lyrical melody. Full of generous impulse and the unbalanced judgment of youth. A genius.
Marryat, Capt. Fred 1792-1848	Peter Simple, Jacob Faithful, etc.	Boy's stories but evincing considerable narrative skill.
Hemans, Felicia 1793-1835	*Lyrics*	A minor poet of grace, sweetness and tenderness.
Grote, George 1794-1871	History of Greece	A learned and sound historian, but superseded by modern exact research.
Arnold, Thomas 1795-1842	Roman History, Sermons, Essays	A man of wide influence as head-master of Rugby. An historian of the old school.
Keats, John 1795-1821	*Endymion, Hyperion, etc.*	A true poet, dying too young to reach full fruition of his remarkable artistic powers.
Pollock, Robert 1798-1827	*Course of Time*	A poet, sound, serious and heavy; suits Scotch theologians.
Hood, Thomas 1798-1845	*Poems*	A humorous poet of the first rank; some pathetic verses of high quality.
VII. THE VICTORIAN PERIOD TO THE PRESENT, 1837- ——		
Lover, Samuel 1797-1868	Handy Andy, Rory O'More; *Songs, Ballads*	A writer of slap-dash Irish and other good stories.
CARLYLE, THOMAS 1795-1881	French Revolution, Cromwell, etc.	A very great though one-sided man. A prose poet, an historian of insight and industry, impatient of shams.
Macaulay, Thomas B. 1800-1859	Essays, History of England; *Lays of Ancient Rome*	He makes history alive and readible. A partisan but on the right side.
James, G. P. R. 1801-1860	Novels (historical)	Historical novels of an antiquated pattern, popular in their day for good reasons.
Miller, Hugh 1802-1856	Old Red Sandstone Schools and Schoolmasters, etc.	A self-made scientific geologist, who did good service in popularizing science.
Praed Winthrop Mackworth 1802-1839	*The Vicar; The Red Fisherman*	The best writer of "Society Verse," urbane, cultured, witty. His verses are beautifully finished.
Martineau Harriet 1802-1876	Political Economy, etc.	A woman of remarkably strong intellect. Her positions well argued but perhaps too radical.
Lytton, Sir Edward Bulwer 1803-1873	Last Days of Pompeii, Last of the Barons, etc.	A versatile and successful litterateur, successful in several forms of the novel, but pre-eminent in none.
Disraeli, Benjamin 1804-1881	Lothair, Vivian Grey, etc.	Society novels eminently readable but thoroughly artificial.
Martineau, James 1805-1900	Philosophical Works, etc.	A philosophical thinker of insight and honesty.
Mill, John Stuart 1806-1873	Political Economy	Of thorough intellectual honesty and diamond-clear intellect, he furthered the cause of political justice and personal freedom.
Lever, Charles 1806-1872	Tom Burker, Charles O'Malley, etc.	Irish tales full of pith and spirit.
DARWIN, CHARLES 1809-1882	Origin of Species, Descent of Man	Lucid and attractive in style, and an unflinching lover of truth; he has had a greater influence on thought than any man of his time.
Milnes, Richard Monckton (Lord Houghton) 1809-1885	Life and Remains of Keats; *Poems, lengendary and historical*	A man of culture not without distinction as a minor poet. A true lover of literature.
FitzGerald, Edward 1809-1883	Euphranor, etc.; *The Rubaiyat*	The Rubaiyat is the only instance where a translation of a classic equals the original. —FitzGerald was one of the last of the great "Letter Writers."
Browning, Elizabeth Barrett—1806-1861	*Aurora Leigh, Poems*	A pleasing lyrical gift and warm, human sympathy made her a favorite poetess in the Victorian era.
TENNYSON, ALFRED 1809-1892	*In Memoriam, Idyls of the King*	The national poet of the late 19th century; a painstaking artist and master of verbal melody.
Kinglake, Alex. William 1809-1890	Eothen	A brilliant historian of the Crimean War.
Gaskell, Elizabeth 1810-1865	Cranford, Mary Barton, etc.	A writer of charming quiet feminine humor. One of the first to make the economic problems the basis of a story.
Thackeray, William Makepeace—1811-1863	Vanity Fair, The Newcomes.	Satirist and humorist, but with great powers of characterization, especially of the every-day social elements.
Dickens, Charles 1812-1870	David Copperfield, Oliver Twist, etc.	A broader humorist than Thackeray, appealing to the common human sympathies and the ordinary sense of the ridiculous.

SUMMARY OF ENGLISH LITERATURE—Continued

Author and Dates	Representative Works	Literary Characteristics
BROWNING, ROBERT... 1812-1889	*Dramatic Lyrics, Poems, The Ring and the Book*.....	A powerful poet, intent more on subtlety than lucidity, intellectual rather than sympathetic.
Reade, Charles..... 1814-1884	Peg Woffington, Cloister and Hearth, etc.....	A vigorous narrator, animated by hatred of injustice. Analysis of human motives, superficial.
Rawlinson, George..... 1815-1902	Five Great Monarchies.....	A learned Assyrian and Oriental scholar.
Trollope, Anthony..... 1815-1882	Barchester Towers, etc.....	Admirably realistic presentation of English society, political and ecclesiastical.
Froude, James Anthony..... 1818-1894	History of England.....	A brilliant prose writer, makes history human and interesting and suggestive.
KINGSLEY, CHARLES..... 1819-1875	Hypatia, etc.; *Poems*.....	His novels, in spite of slight affectations and a taint of sentimentality, are vigorous and wholesome.
RUSKIN, JOHN..... 1819-1900	Stones of Venice, Modern Painters.....	A great stylist. As art-critic too subjective and governed by the moral suggestiveness of the object. As political economist, too idealistic and regardless of human nature.
Bronte, Charlotte..... 1816-1855	Jane Eyre, The Professor, etc.	Great power in her novels which however, are based on narrow experience.
SPENCER, HERBERT.... 1820-1903	First Principles, etc.....	Applied principle of evolution to sociology, history, etc. A thinker, but ponderous in style.
ELIOT, GEORGE..... 1819-1880	Silas Marner, etc.; *Spanish Gypsy, Poems*.....	The greatest woman novelist. A realist with insight. Powers of wit and characterization; construction not remarkable.
TYNDALL, JOHN..... 1820-1893	Scientific Papers.....	Unsurpassed as a popularizer of Darwin's ideas, unless it be by Huxley.
ARNOLD, MATTHEW..... 1822-1888	Essays and Criticisms; *Sohrab and Rustum, etc*.....	Critic and poet. Liberal in thought but dominated by aristocratic prejudice on the literary side. As a poet, inclined to despairing pessimism; weak in the power of verbal melody.
Muller, Max..... 1823-1900	Science of Language, etc.....	Did much to spread knowledge of the general facts and principles of philology and Oriental learning.
FREEMAN, EDWARD A..... 1823-1892	Histories.....	A conscientious, honest, painstaking historian, destitute of the power to make his subject interesting except to himself.
Hughes, Thomas..... 1823-1896	Tom Brown at Oxford, etc...	A manly, breezy person, who wrote one good book for boys.
Collins, Wilkie..... 1824-1889	Woman in White, etc.....	Unsurpassed as a constructor of plots, i. e. a born story-teller, not misled by psychological analysis.
Macdonald, George..... 1824-1905	Sir Gibbie, Alec Forbes, etc.	Wrote many novels showing some power of writing dialogue. Essentially of his day.
HUXLEY, THOMAS HENRY... 1825-1895	Man's Place in Nature.....	A master of exposition and, with Tyndall, very effective in presenting the idea of evolution.
BLACKMORE, R. D..... 1825-1900	Lorna Doone, etc.....	Infused an element of romance into the modern novel, "Lorna Doone."
Bagehot, Walter..... 1826-1877	Physics and Politics.....	Original, sound, and striking on political and economic topics.
Mulock, Dinah Naria..... 1826-1887	John Halifax, etc.....	Author of some twenty novels of which "John Halifax" is the best. Also of pleasing minor verse.
Rossetti, Dante Gabriel..... 1828-1882	*The Blessed Damozel, etc*.....	A highly imaginative poet; a master of color in verse and on canvas.
Oliphant, Margaret..... 1828-1897	Chronicles of Carlingford, etc.	Novels of middle-class life, of excellent tone, full of quiet observation. Plots, slight, but hold the attention.
MEREDITH, GEORGE..... 1828-1910	The Egoist, Diana of the Crossways, etc.....	Novels of extraordinary power. Style epigrammatic and not attractive.
McCarthy, Justin..... 1830-1912	History of our own Times, Novels.....	A prolific journalist, novelist and historian of modern times.
Ingelow, Jean..... 1820-1897	*Poems, High Tide on Coast of Lincolnshire*.....	A charming lyrical talent, of limited productive power.
Meredith, Owen..... 1831-1891	Biography of Bulwer Lytton; *Lucile*.....	Fluent writer of light verse and society verse.
Arnold, Edwin..... 1832-1904	*Light of Asia, Poems*.....	An able journalist and prolific minor poet.
Seeley, John Robert..... 1834-1895	Ecce Homo, etc.....	An able historical writer, his "Ecce Homo" had considerable influence on contemporary philosophies—religious thought.
MORRIS, WILLIAM..... 1834-1896	Essays on Art, etc.; *Poems, Earthly Paradise*.....	Prolific as a narrative poet, fond of classic and medieval legends. As a poet, more fluent than thoughtful.
Hamerton, Philip I..... 1834-1894	Intellectual Life.....	An excellent critic of pictorial art and interpreter of French life and character for Englishmen.
Green, John Richard..... 1837-1883	History of the English People.	Industrious and conscientious, he viewed the "History of the English People" as something more than a record of war and politics. Clear and simple as a stylist.

SUMMARY OF ENGLISH LITERATURE—Continued

Author and Dates	Representative Works	Literary Characteristics
Swinburne, Algernon Chas., 1837-1909	*Poems*	A poet of remarkable musical power, a master of headlong but involved prose, a critic of enthusiasm and eloquence, caring little for principles or reasoned judgment.
Bryce, James 1838-	American Commonwealth, Holy Roman Empire	A writer on politics of great common sense and statesmanlike scope. A trustworthy authority.
Besant, Walter 1838-1901	East London, etc., Novels	A voluminous writer of novels, his History of London is a real contribution to knowledge of the past.
Morley, John 1838-	English Men of Letters	A sound literary historian and critic and a thinker of force and scope.
Pater, Walter Horatio 1839-1891	Marius the Epicurean, etc.	A wonderfully finished prose style which sometimes diverts attention from the justness and beauty of the thought.
Dobson, Henry Austin 1840-	Vignettes in Rhyme, Proverbs in Porcelain	The English Horace. An authority on eighteenth century social and literary life, Charming light verses.
Hardy, Thomas 1840-	Tess of D'Urbeville, etc., Novels	Novels depicting country life. A writer of broad humanity. His books possess at once wit, realism and an idyllic quality.
Black, William 1841-1898	In Silk Attire, etc , Novels	His stories have considerable charm but not much force. They depict Gaelic Scotland pleasantly but unconvincingly.
Buchanan. Robert W. 1841-1901	Alone in London; *Poems*	A minor poet and dramatist of considerable output. Known for his mistaken attack on Rosetti in "The Fleshly School of Poetry."
Stevenson, Robert Louis 1850-1894	Essays, Novels; *Child's Garden of Verses, etc.*	Careful and finished as a stylist, an excellent story-teller: "Treasure Island" and his Scottish Tales are true classics.
Zangwill, Israel 1864-	Novels, Dramas, Essays	As Jew, an exponent of the Zionistic movement. Successful in the essay and especially in the novels depicting Jewish scenes and characters.
Kipling, Rudyard 1865-	Stories, Novels, *Poems*	A vigorous, audacious, efficient writer. The most original genius among English literary men of today.
Phillips, Stephen 1868-	*Ulysses, Paolo and Francesca.*	A writer of lyric tragedies in blank verse, akin in spirit to the French classic drama.

AMERICAN LITERATURE

The development of American literature may be treated under three distinctly marked periods: (1) a colonial or ante-revolutionary period (1620-1775), during which the literature of the colonies was closely assimilated in form and character to that of England; (2) a first American period (1775-1865), which witnessed the transition from a style for the most part imitative to one in some degree national; and (3) a second American period from 1865 to the present time, in which the literature of the country has assumed a more decided character of originality.

THE COLONIAL PERIOD, 1620-1775

The literary traditions of the United States were in large part inherited from England. Although from the time of the Stuart restoration in England, in 1660, there are indications of a divergence in social and political temper, which in the long run must find expression in a distinct American literature, yet the literary emancipation of America was much more gradual than the political.

The first literature in America was the product of men educated in other lands, who happened to be drawn to the New World, and who wrote about the new country.

The first work of broad interest concerning the colonies that subsequently became the United States was the famous Captain John Smith's *True Relation of Such Occurrences and Accidents of Note as Hath Happened in Virginia.* This is an interesting and romantic work; but Smith was in America for three years only of his adventurous life, and consequently his narrative is highly colored. *The History of the Plymouth Plantation,* by Governor Bradford, and the *History of New England,* by John Winthrop, are productions of a colder clime than Virginia and of a less glowing imagination than Captain John Smith's.

Aside from such records, more interesting always from the standpoint of history than from that of literature, the sum of colonial production, north or south, is very small. In New England, where most books were written, if not always there published, we find chiefly theological polemics, often presented with attractive titles but rarely with any other power to carry them to posterity.

The *Poems* of Anne Bradstreet were very highly praised in their day, but almost the only book of lasting value and interest written in the century was Cotton Mather's *Magnalia Christi Americana* (1702). Mather was one of a great clerical and literary family. He wrote many other books, but none retains the interest of posterity. The *Magnalia,* however, is still a noble monument of a wonderful generation.

Franklin's *Poor Richard's Almanac,* begun in 1732 and carried on by him for twenty-five years, was a book of almost literary rank. "Poor Richard" was a fictitious character in whose

mouth Franklin put a simple philosophy which became as widely popular in its sphere as the more scholarly utterances of the Spectator.

The two great literary figures of the eighteenth century may be properly considered together. Jonathan Edwards (1703-1758) may represent to us the passing domination of theology; Benjamin Franklin, the domination just beginning of politics and secular common sense. They are the first Americans to make a lasting reputation by letters, and, curiously enough, with each literature was but a means to an end.

The remarkable effect of the preaching and writing of Jonathan Edwards came largely from the direct simplicity and clearness which makes his style almost no style at all. As for Franklin, he learned to write systematically, as he did everything else, and regarded his power to express himself chiefly as one of the means whereby he accomplished his purposes for the good of society. Edward's great works on the *Freedom of the Will* and other theological topics are probably read now by few, and the same may be said of much of Franklin's writings. But Franklin's *Autobiography* is still one of the most interesting things of its kind. Both men belonged to the time and place: America was expressing herself, whether in literary form or not.

In the years preceding the Revolution another real opportunity opened, and oratory became one of the genuine modes of national expression. Patrick Henry, James Otis, John Adams, Joseph Warren, Richard Henry Lee, Samuel Adams, spoke under the best conditions for literature, because they had something that had to be said. Yet their eloquence now is more a matter of fame than of fact. Of some, hardly more than a few slight reports remain to give us a notion of the powers that fired an earlier generation. This summary of colonial literature gives an idea of a very meagre literary production that was but natural. There was little written in America, and that little was compelled by the practical issues of the politics or theology of the time.

We shall readily understand that though such a review indicates slight literary appreciation as we understand the term, it does not imply a lack of intelligence. If the colonists had been less intelligent they might have produced more literature. Folk poetry and legend, with which true literature is apt to begin, is not the result of education.

The Americans were, comparatively speaking, a well-educated people. They very early provided for that literary scholarship training which comes from scholastic training. The colleges of the colonies, Harvard (1636), William and Mary (1693), Yale (1701), Princeton (chartered as the College of New Jersey, 1746), Columbia (originally King's, 1754), Brown (College of Rhode Island, 1764), Rutgers (originally Queens, 1766), Dartmouth (1769), and the University of Pennsylvania (founded as an academy by Franklin, 1754; chartered 1779), show a great appreciation of learning on the part of the colonists.

A somewhat wider if less scholastic culture is evidenced by the foundation of libraries, the Library Company of Philadelphia (1731), the Redwood Library of Newport (1747), the Charleston Library (1748), and the New York Society Library (1754), being the earliest.

FIRST NATIONAL PERIOD, 1775-1865

The two decades that brought the eighteenth century to a close were full of exciting political events, but barren of literature. The fathers could make a nation by adopting a constitution and abiding by it, but the creation of a national literature was not so easy a matter. National poetry did not come with national life. The efforts of Trumbull (1750-1831), and Barlow (1754-1812), are as good as the ordinary poetical work of the time in England, but they are not the expression of the soul of the new nation.

The first real literature was in prose, arising from natural imitation of past models under conditions of culture which led to appreciation of such imitation.

Washington Irving, then twenty-four years old, living the pleasant life of a clever young fellow in a small provincial city, joined with his brother William and James Kirke Paulding in one of the periodicals modeled after the *Spectator* common in the eighteenth century. Their venture was called *Salmagundi*, and although not remarkable in itself, its success gave confidence, so that two years afterward, feeling his own power, Irving wrote *Knickerbocker's History of New York*, one of the first pieces of American *belles-lettres* to become known in Europe as well as America. These productions came naturally from the conditions of Irving's life; so did the *Sketch Book*, with which he became a professed man of letters, the representative, we may say, of the first period of our national literature.

Irving had pre-eminently the gift for literary expression; in his hands everything became literature—history, biography, descriptive as well as satire, story, essay. He showed the possibility of giving literary form to American material.

The same thing was done in a special department of literature by James Fenimore Cooper. Charles Brockden Brown had written novels, but they have not survived. Cooper, on the other hand, so far saw the essential quality of certain elements of American life, that the figures of Leatherstocking, the American pioneer, Harvey Birch, the patriot, and Long Tom Coffin, the sailor, are still living figures.

In fiction also two masters of equal power were shortly to develop a form of literature in which America has produced much of the first order. Nathaniel Hawthorne and Edgar Allan Poe made of the short story a means of artistic presentation, which has been more highly appreciated in our day than it was in their own.

The first true poet was William Cullen Bryant. In the same year with Cooper's first American novel (1821) appeared a volume of Bryant's poems, of which one at least, *Thanatopsis*, had already excited admiring attention. Bryant's long and honorable life was devoted to many interests beside poetry, but he maintained throughout the pure and idealistic touch, and the intimate appreciation of nature that characterized his first work.

The first quarter of the nineteenth century, then, saw a beginning, slight indeed, but such as to endure, of a true literature in the departments of poetry, fiction, *belles-lettres*. The fifty years

following saw more substantial production in each direction.

The American poets of the middle of the century are not of the very first rank, but each is genuinely representative of some true poetic quality or way of looking at things.

Henry Wadsworth Longfellow presents the beauty and charm of American life and history in melodious and figured verse; John Greenleaf Whittier expresses the soul of our life and history in lyrics of most sincere human quality; Edgar Allan Poe gives a few most intense emotions in singularly perfect and individual form, while Walt Whitman expresses a certain American ideality in a strange mode of utterance, which despite its faults is characteristically strong.

As a poet Lowell is at his best in satire, Holmes in wit, Emerson in sententious wisdom.

In the field of fiction there was not so much that was good. It was not till he had written short stories for twenty years that Hawthorne found time for the novel for which he had so long felt himself capable. He wrote four, of which three at least are masterpieces. As a novelist he had no rivals; but there were not a few who carried on the tradition of the short story, of whom the most noteworthy were Fitz James O'Brien (1828-1862), Harriet Prescott, 1835 (afterward Mrs. Spofford), and Edward Everett Hale. *The Diamond Lens*, *The Amber Gods*, and *The Man Without a Country* of the latter are very typical works.

In history also there was first-rate expression. George Bancroft, William H. Prescott, John Lothrop Motley, and Francis Parkman, were all original workers and all men of literary power. The first two were rather too much influenced by the literary ideals of the past, but Motley and Parkman attain a perfection of literary history which seems impossible in our day of development and division of labor.

More specifically American, though perhaps more temporary, is the oratory of the period. Political conditions were still such as to encourage eloquence. Three names stand together as representative of American public life: Daniel Webster, Henry Clay, and John C. Calhoun. Their oratory has dignity, representative character and force. Three other orators should be mentioned: Edward Everett, Wendell Phillips, and Henry Ward Beecher, one eminent on great public occasions, one in public discussion and agitation, and the third in the pulpit. And we must add the name of a speaker whose simple sincerity gave him at times a greater power of speech than that of any other man of his day, Abraham Lincoln.

Several other elements of the literature of this time are important. The New England movement of idealistic thought, somewhat expressed by Transcendentalism, is represented by Ralph Waldo Emerson, a figure more thoroughly characteristic of American thinking than any other writer. Singularly individual and different from any other man of his time, he is yet typical of a combination of ideality and common sense thoroughly American.

James Russell Lowell is another important figure of the period: noteworthy as a poet, a critic, a scholar, an essayist, he is especially interesting as the successor of Irving as the representative man of his literary generation. He made literature an active factor in life and yet never allowed it to lose its literary quality.

Oliver Wendell Holmes is best known as a humorist, and perhaps the most American in that field in which America has a very special place. Humor is more than most branches of literature a matter of taste. It must be enough, therefore, to note, without attempting to discriminate or describe, the achievements of Artemus Ward (1834-1867), of Mark Twain and of Frank R. Stockton (1834-1902). In this second period of our literature occurred the Civil war. Such an event could not have been without its effect upon men of letters both South and North. In the North especially do we perceive the strongest influence: the anti-slavery element cannot be dissociated from the work of Lowell or Whittier. Yet in literature the war produced little of permanence. It is the backbone of Mrs. Harriet Beecher Stowe's title to remembrance; but powerfully effective as was *Uncle Tom's Cabin*, it is probable that there was more real genius in those presentations of that old New England life of which she was herself a product.

SECOND NATIONAL PERIOD, 1865- ——

In considering the period from the Civil war to the present, the most remarkable thing is the great increase of production and the slight accession to the rolls of genius. Such is especially the case with fiction; there have been very many good novels and short stories written, but there is no such commanding personality as Hawthorne.

The two chief figures of the seventies and eighties, at least, were Henry James and William Dean Howells. With great differences, they are yet both masters of the realistic school which was dominant in the second half of the century, in Europe as well as in America. Their superiority might remain unquestioned, were it not for the decline of interest in the kind of novel in which they excelled. In the early eighties a change in tone was perceptible.

The first noteworthy American representative of romantic or idealistic fiction which then began to appear was Marion Crawford, who has retained power and popularity for twenty-five years. He and a few other innovators were followed by a number of writers who found and presented the charm and romance of American history. These have now in their turn passed away except Winston Churchill who would seem really to have more enduring power than his companions. But the realistic movement was not without its results, for it directed American novelists, and especially story writers, into an appreciation of the specific qualities of different parts of their country.

The first writer to have this especial flavor was, it is true, the romanticist Bret Harte. His followers were more realistic: George Washington Cable gave a charming presentation of Creole life in New Orleans, and since the *Grandissimes* (1880) there have been a great number who have drawn pictures of the especial life of particular localities. Most noteworthy of these are Miss Mary N. Murfree ("Charles Egbert Cradock"), Miss Mary E. Wilkins (now Mrs. Freeman), James Lane Allen, Thomas Nelson Page, and Hamlin Garland.

If we are to mention any other novelist of the present day whose work seems likely to endure, it must be Mrs. Edith Wharton, who rather continues the traditions of Henry James.

In poetry no one has for forty years appeared who has been considered the equal of the earlier generation. Sidney Lanier and Edmund Clarence Stedman will probably be considered the chief figures of the seventies, while Richard Hovey (1864-1900) and James Whitcomb Riley are superior to their later contemporaries.

There has been much history in recent years, and if there are no historians of the rank of Motley and Parkman, the reason may lie in the difference that has come into the methods of historical study. John Fiske was a philosopher before he became a historian. Justin Winsor was a master of authorities, and his labors as an editor rendered possible one of the characteristic productions of the time, the *Narrative and Critical History of America*, written by a number of special scholars. Of other contemporary writers most noteworthy are probably Henry C. Lea, whose works deal with different phrases of the history of civilization, and Captain A. T. Mahan, whose studies of the influence of sea power on history have attracted the attention of the world.

Coincidently, a new school of humor has risen in the writing of F. P. Dunne, creator of the sagacious *Mr. Dooley*, and George Ade, author of *Fables in Slang*. Earlier humorists, aside from "Mark Twain" and Charles F. Browne ("Artemus Ward"), are Henry W. Shaw ("Josh Billings") (1818-1885), Joel Chandler Harris (1848-1908), the author of *Uncle Remus' Stories*, amusing dialect fantasies. In the summary of American literature one can hardly omit the names of Sarah Margaret Fuller ("Ossoli"), R. H. Dana, author of *Two Years Before the Mast*, and Donald G. Mitchell, author of *Reveries of a Bachelor* and *Dream Life*.

Recent and contemporary historians and essayists deserving of mention are T. W. Higginson, C. E. Norton, and William James.

Another form of writing should be mentioned' though its results are perhaps too ephemeral to be called literature. The newspaper is, however, a very important part of everybody's reading. It has been learning, however, to appeal more and more to an enormously wide audience, with the result that whatever literary character it may have had is now hard to find. In the middle of the century certain great editors had very definite literary standing, as Bryant of the New York *Evening Post*, Henry J. Raymond (1820-1869) of the *Times*, Horace Greeley (1811-1872) of the *Tribune*. Later figures must include Charles A. Dana (1819-1897), who gave a very distinctive character to the *Sun;* James Gordon Bennett (1841) of the *Herald*, and E. L. Godkin (1831-1902) of the New York *Evening Post*, and Henry Watterson of the Louisville *Courier-Journal*.

SUMMARY OF AMERICAN LITERATURE

NOTE.—Poetic and dramatic writings are indicated by *italics*.

AUTHOR AND DATES	REPRESENTATIVE WORKS	LITERARY CHARACTERISTICS
John Smith. Virginia—1580-1631	True Relation of Virginia	A romantic recital of thrilling adventures.
William Bradford. Plymouth Col.—1588-1657	History of Plymouth Plantation	A full and clearly written account to 1649.
John Winthrop. Massachusetts—1590-1649	History of New England—1630-1649	A simple, personal narrative, with occasional freshness of style.
Anne Bradstreet. Massachusetts—1613-1672	*Poems; The Tenth Muse*	An affected and cumbersome didactic poem.
Henry Norwood. Virginia—1628-1670 (?)	A Voyage to Virginia	Surprisingly well written in parts, and informative.
William Penn. Pennsylvania—1644-1718	Brief Account of Pennsylvania	Confidently religious and philanthropic in tone.
James Blair. Virginia—1656-1742	Sermons, No Cross, No Crown	Comparatively modern prose, written with pious zeal.
Cotton Mather. Massachusetts—1663-1728	Elegy of Rev. Nathaniel Collins, Sermons, etc.	Voluminous ecclesiastical writings of "pedantic and fantastic quaintness."
William Byrd. Virginia—1674-1744	The Dividing Line, and other tracts	Full of fresh, humorous observations on life.
Robert Beverly. Virginia—1675-1716	History of Virginia	A straightforward narrative of slightly polemic purpose.
JONATHAN EDWARDS. Connecticut—1703-1758	Sermons, Surprising Conversions, etc.	Strong and highly imaginative proclamations of Calvinism.
BENJAMIN FRANKLIN. Pennsylvania—1706-1790	Poor Richard's Almanac, Autobiography	Wise and sagacious utterances of a fair, avowed utilitarian.
THOMAS JEFFERSON. Virginia—1743-1826	Notes on Virginia, Declaration of Independence	Full of wise foresight and keen acumen.
JOHN MARSHALL. Virginia—1755-1835	Life of Washington, Decisions etc.	Profound and wise, but rather heavy.
ALEXANDER HAMILTON. New York—1757-1804	Contributions to the Federalist	Keen and ingenious, full of information.
Alexander Wilson. Scotland—1766-1813	American Ornithology	Pioneer investigations of a shrewd observer.
Charles Brockden Brown. Pennsylvania—1771-1810	Wieland, Ormond, etc.	Weird and sensational, of the Godwin type.
William Wirt. Maryland—1772-1834	Life of Patrick Henry, Letters of a British Spy	Interesting and informative, but also imaginative.
Robert Treat Paine. Massachusetts—1773-1811	Adams and Liberty; *Poems.*	Superficial, but of noticeable metrical facility.

SUMMARY OF AMERICAN LITERATURE—Continued

Author and Dates	Representative Works	Literary Characteristics
Henry Clay. Kentucky—1777-1852	Speeches, Letters	Attractive because of personality and power.
Washington Allston. South Carolina—1779-1843	Art Lectures; *Poems*	Highly artistic in intent and achievement.
James Kirk Paulding. New York—1779-1860	Novels	Romances of little present interest.
Francis Scott Key. Maryland—1780-1843	*Poems, Star Spangled Banner, etc.*	The chief poem is a national song of patriotic ardor.
William E. Channing. Massachusetts—1780-1842	Addresses, Sermons, Essays	Social papers, clear, tolerant, thoughtful.
John James Audubon. Louisiana—1780-1851	Birds of America, Quadrupeds of America	Marked by keen observation and wide interest.
John C. Calhoun. South Carolina—1782-1850	Speeches, Papers, etc.	Forceful in logical thinking and clear exposition.
Daniel Webster. New Hampshire-1782-1852	Orations	Elevated in thought and eloquent.
Thomas Hart Benton. North Carolina—1782-1858	Thirty Years View	Rich and racy observations of wide experience.
Washington Irving. New York—1783-1859	Knickerbocker's History of New York, Sketch Book, etc.	Humorous, with delicate sentiment and grace.
Richard Henry Dana. Massachusetts—1787-1879	*Poems, The Buccaneer, etc.*	Overambitious and not wholly successful.
James Fenimore Cooper. New Jersey—1789-1851	Leather Stocking Tales, The Spy, etc.	Romantic and overfortunate in coincidence, but readable.
Jared Sparks. Connecticut—1789-1866	American Biographies	Commendable efforts of a pioneer biographer.
Fitz Greene Halleck. Connecticut—1790-1867	*Poems, Marco Bozzaris, etc.*	Frankly humorous and delightfully fresh.
George Ticknor. 1791-1871	History of Spanish Literature.	Scholarly and authentic.
John Howard Payne. New York—1792-1852	*Home Sweet Home, Poems*	Universal in appeal and satisfying in form.
Samuel G. Goodrich. Connecticut—1793-1860	Peter Parley Books	Popular introductions with a flavor of fiction.
William Cullen Bryant. Massachusetts—1794-1878	Addresses, Letters; *Poems, Thanatopsis.*	Dignified and poised, serious and helpful.
Joseph Rodman Drake. New York—1795-1820	*The Culprit Fay, Poems*	Cleverly executed, but ingeniously fanciful.
James G. Percival. Connecticut—1795-1856	*Poems; Prometheus, etc.*	Unsustained, though not without positive merits.
John Pendleton Kennedy. Maryland—1795-1870	Swallow Barn, Horse Shoe Robinson, etc.	Old-fashioned but interesting pictures of southern life.
WILLIAM H. PRESCOTT. Massachusetts—1796-1859	Conquest of Peru, Ferdinand and Isabella, etc.	Excellent history, very interestingly told.
Amos Bronson Alcott. Massachusetts—1799-1888	Concord Days, Table Talks; *Sonnets and Canzonets.*	Suggestingly idealistic, but lacking in general interest.
George Bancroft. Massachusetts—1800-1891	History of the United States.	Faithfully prepared and honestly presented.
Horace Bushnell. Connecticut—1802-1876	Nature and the Supernatural, Work and Play	Serious, didactic efforts with spiritual purpose.
George D. Prentice. Connecticut—1802-1870	Essays; *Poems*	Witty, sarcastic, daring and effective
RALPH WALDO EMERSON, Mass.—1803-1882	Conduct of Life, Representative Men, Essays; *Poems*	The prophet of American culture. Coalesces oriental conceptions and occidental individualism.
Jacob Abbott. Maine—1803-1879	Rollo Books	Popular favorites of unsophisticated youth.
NATHAN'L HAWTHORNE Massachusetts—1804-1864	Twice Told Tales, Scarlet Letter, Marble Faun, etc.	Marked by a subtle mastery and the touch of genius.
Charles E. A. Gayarré. Louisiana—1805-1895	History of Louisiana, Fernando de Lemos, etc.	Entertaining and scholarly bilingual productions.
Nathaniel P. Willis. Maine—1806-1867	*Poems;* Sketches, Editorials, etc.	Skillfully elaborated but diminishing in fame.
William Gilmore Simms. South Carolina—1806-1870	*Poems;* Novels, Biography, etc.	Versatile, original and artistic.
HENRY W. LONGFELLOW Maine—1807-1882	*Outre Mer, Hyperion, Poems, Hiawatha, etc.*	Popular in appeal and simple in form.
John G. Whittier. Massachusetts—1807-1892	Editorials; *Household Poems.*	With Burns' love of nature and human nature.
EDGAR ALLAN POE. Maryland—1809-1849	Tales; *Poems, Raven, Annabel Lee, etc.*	Excellent in artistic "totality of effect."
Albert Pike. Massachusetts—1809-1891	*Hymns to the Gods, Poems, etc.*	Of recognized interest and merit.
Oliver Wendell Holmes. Massachusetts—1809-1894	Autocrat of the Breakfast Table, Novels; *Poems*	Clever, witty, versatile, and skillful.
Margaret Fuller Ossoli. Massachusetts—1810-1850	Summer on the Lakes, Papers on Literature and Art	Notable in transcendental aim and in merit of achievement.

SUMMARY OF AMERICAN LITERATURE—Continued

Authorand Dates	Representative Works	Literary Characteristics
Harriet Beecher Stowe..... Connecticut—1811-1896	Uncle Tom's Cabin, etc.....	Far-reaching in its influence.
JOHN LOTHROP MOTLEY Massachusetts—1814-1877	Dutch Republic, United Netherlands.....	A rapid, easy style in presenting results of research.
Rufus W. Griswold..... Vermont—1815-1857	*Christian Ballads;* Poets and Poetry of America, Famous Poets.....	Valuable critical studies marred by partisanry.
John G. Saxe..... Vermont—1816-1887	*The Money King, New Rape of the Lock,* etc.....	Humorous and sprightly.
Samuel A. Allibone..... Pennsylvania—1816-1889	Literature and Authors, etc.	Laborious and valuable.
Henry D. Thoreau..... Massachusetts—1817-1862	Walden, Excursions.....	Redolent of nature love, and cultured scholarship.
J. G. Holland..... Massachusetts—1819-1881	Timothy Titcomb's Letters, Katrina.....	Enjoyed a large popularity.
Edwin P. Whipple..... Massachusetts—1819-1886	Essays and Reviews, American Literature.....	Of very distinct cultural value.
James Russell Lowell.... Massachusetts—1819-1891	Among My Books, My Study Windows, Bigelow Papers, *Poems, Sir Launfal, etc.....*	Keen, sparkling, scholarly, and artistic.
Walt Whitman..... New York—1819-1892	*Poems, Leaves of Grass, My Captain, etc.....*	Unique in claim and form.
Julia Ward Howe..... New York—1819-1910	Social and Philosophical Papers, *Battle Hymn of the Republic.....*	Representative of the spirit of the times.
Margaret J. Preston..... Virginia—1820-1897	Beechen Brook, Cartoons, *Colonial Ballads.....*	Cultured and of human interest.
Richard Grant White..... New York—1821-1885	Words and Their Uses; Everyday English.....	Scholarly and suggestive.
Thomas Buchanan Read.... Pennsylvania—1822-1872	*Poems; Drifting; Sheridan's Ride, etc.....*	Commendable, especially in form.
Edward Everett Hale..... Massachusetts—1822-1909	The Man Without a Country, His Level Best.....	Vigorous and pointed, but provincial.
Donald G. Mitchell..... Connecticut—1822-1909	Dream Life, Reveries of a Bachelor.....	Attractive in meditation and grace.
Francis Parkman..... Massachusetts—1823-1893	Oregon Trail, Montcalm and Wolfe, etc.....	Romantic, picturesque and of real interest.
George W. Curtis..... New York—1824-1892	Potiphar Papers, Prue and I, etc.....	Widely popular and effective.
Bayard Taylor..... Pennsylvania—1825-1878	Northern Travel, Greece and Russia; *Poems of the Orient, Translation of Faust.....*	Too good at many things to be best at any.
Stephen Collins Foster..... Pennsylvania—1826-1864	*Old Folks at Home, Old Uncle Ned, etc.....*	Popular in vein and melody.
Lew Wallace..... Indiana—1827-1905	The Fair God, Prince of India, Ben Hur.....	Uneven, but at times highly successful.
Chas. Dudley Warner..... Massachusetts—1829-1900	My Summer in a Garden, Little Journeys, etc.....	Catholic in interests and attainments.
John Esten Cooke..... Virginia—1830-1886	Novels, Curvey of Eagle's Nest, etc., Lives of Lee and Jackson.....	Prime favorites with romantic youth.
Paul Hamilton Hayne..... South Carolina—1831-1886	*Sonnets, Legends, Lyrics.....*	In sonnets excellent, in other poems too prolific.
Louisa May Alcott..... Massachusetts—1832-1888	Little Women, Little Men...	Influential in their popular appeal.
Edmund C. Stedman..... Connecticut—1833-1908	Victorian Poets, Poets of America, Alice of Monmouth.....	Showing creative power and critical ability.
Chas. Farrar Browne (Artemus Ward), Maine—1834-1867.....	Artemus Ward, His Book, etc.	Humorous in exaggeration and perversion.
Frank R. Stockton..... Pennsylvania—1834-1902	Rudder Grange, The Lady or the Tiger.....	Ingenious in plot, straightforward in style.
Moses Coit Tyler..... Connecticut—1835-1900	History of American Literature.....	Accurate and exhaustive.
Samuel L. Clemens..... Missouri (1835-1910)	Innocents Abroad, Huckleberry Finn, etc.....	Thoroughly representative of American humor.
Thomas Bailey Aldrich..... New Hampshire-1836-1907	Novels, Marjorie Daw, etc...	Cultivated and of literary talent.
William Dean Howells... Ohio—1837-	Venetian Life; Rise of Silas Lapham, etc.....	Realistic and entertainingly descriptive.
John Burroughs..... New York—1837-	Wake Robin, Winter Sunshine.....	Strongly uttering the charms of nature.
Mary Mapes Dodge..... New York—1838-1905	Hans Brinker.....	In high favor with children.
Albion W Tourgee..... Ohio—1838-1905	A Fool's Errand, Bricks Without Straw.....	Valuable for the point of view.

SUMMARY OF AMERICAN LITERATURE—Concluded

Author and Dates	Representative Works	Literary Characteristics
Thomas R. Lounsbury..... New York—1838-1915	Life of Cooper, Studies in Chaucer, etc.....	Of recognized scholarship and ability.
Francis Bret Hart..... New York—1839-1902	Luck of Roaring Camp, Gabriel Conroy; *Poems*...	Of international fame. Faithful and skillfull character portrayal.
Joaquin Miller..... Indiana—1841-1913	*The Danites in the Sierras* *Surge of the Sierras*.....	With the sweep and breadth of the prairies.
Sidney Lanier..... Georgia—1842-1881	The Boy's Froissart; *Tiger-Lilies, Poems*.....	Artistic to a high degree.
John Fiske..... Connecticut—1842-1901	Myths and Mythmakers Histories.....	Scholarly and fairminded.
Henry James..... New York—1843-1916	Daisy Miller, Portrait of a Lady, etc.....	Of characteristic conception and style.
George W Cable..... Louisiana—1844-	Old Creole Days, etc.....	Successful in achievement of purpose.
Elizabeth S. Phelps Ward... Massachusetts—1844-1911	Gates Ajar, etc.....	Widely read for religious sentiment.
Arthur S. Hardy..... 1847-	Passe Rose, etc.....	Of trained literary ability.
James Lane Allen..... Kentucky—1849-	Flute and Violin, The Choir Invisible, etc.....	Reaching a high standard of excellence.
Francis Marion Crawford... New York—1854-1909	Novels, Travel, Descriptive Sketches.....	Best known for his Saracinesca series, the scenes of which are laid in modern Rome.
James Whitcomb Riley.... Indiana—1852-1916	*Poems, Rhymes of Childhood, The Book of Joyous Children, etc.*	His combination of humor, pathos, and sentiment appeals to high and low alike.
Mary N. Murfree (Charles Egbert Craddock), Tenn.—1850-	Novels, In the Tennessee Mountains, etc.....	Absorbing studies in southern life and character.
Eugene Field..... Missouri—1850-1895	*Poems, Little Boy Blue, A Dutch Lullaby, Love Song of Childhood, etc*.....	Holds a special place in American literature as the poet of Christmas and childhood.
Amelie Rives..... Virginia—1863-	Novels, Virginia of Virginia, The Quick or the Dead, etc. *Poems*.....	Her later writings show more charity of thought and richness of expression than was characteristic of her earlier productions.
Thomas Nelson Page..... Virginia—1853-	Novels, On Newfound River, Marse Chan, etc.....	An interpreter of local life and color of unusual insight.
Henry J. van Dyke..... Pennsylvania—1852-	Novels, The Other Wise Man, etc.; *Poems*.....	Keen in observation, healthful in tone, delightful in style.

PRONOUNCING DICTIONARY OF LITERARY ALLUSIONS

Concise, explanatory paragraphs concerning Famous Books, Poems and Dramas; Literary Characters, Plots and Scenes; Pen Names of Famous Writers; Soubriquets and Nicknames; Literary Geography, Shrines and Haunts; and numerous other literary references.

KEY TO THE SOUNDS OF LETTERS

ä, as in farm, father; *à*, as in ask, fast; *a*, as in at, fat; *ā*, as in day, fate; *â*, as in care, fare; a, as in final; *e*, as in met, set; *ē*, as in me, see; *ē̇*, as in her, ermine; *i*, as in pin, sin; *ī*, as in pine, line; *o*, as in not, got; *ō*, as in note, old; *ȯ*, as in for, fought; *ȯ́*, as in sole, only; *ȯ̂*, as in fog, orange; *ȯ̇*, sound cannot be exactly represented in English. The English sound of *u* in *burn* is perhaps the nearest equivalent to *ȯ̇*; *oo*, as in cook, look; *ōō*, as in coon, moon; *u*, as in cup, duck; *ū*, as in use, amuse; *û*, as in fur, urge; *ü̇* sound cannot be exactly represented in English. The English sound of *u* in *luke* and *duke* resembles the original sound of *ü̇*. The letter N represents the nasal tone of the preceding vowel, as in *encore* (*äN-kōr′*).

Aaron (*ā′ron* or *ar′on*).—A character in Shakespeare's *Titus Andronicus*, a Moor of unnatural wickedness beloved by Tamora, queen of the Goths. The character shows originality of conception, but is otherwise repellant.

Abaddon (*a-bad′on*).—The Hebrew name of an evil spirit or destroying angel called Apollyon in Greek. In mediæval literature he is regarded as the chief of the demons of the seventh hierarchy and the one who causes wars and uproars. Klopstock introduced him in his *Messiah* under the name of Abbadona. He represents him as a fallen angel still bearing traces of his former dignity and repenting of his part in the rebellion against God. In Bunyan's *Pilgrim's Progress* he meets and fights with Pilgrim.

Abdalla (*ab-dal′ä*).—(1) The Mufti, a character in Dryden's tragedy *Don Sebastian*. (2) One of Sir Brian de Bois Guilbert's slaves, in Scott's *Ivanhoe*. (3) Brother and predecessor of Giaffer, pasha of Abydos, by whom he was murdered, in Byron's *Bride of Abydos*.

Abdiel (*ab′di-el*).—A seraph in Milton's *Paradise Lost*, the only seraph who remained loyal when Satan stirred up the angels to revolt.

Abonde (*a-bōn-de′*).—A character in French literature that corresponds to our Santa Claus, the good fairy who comes at night, especially New Year's night, to bring toys to children while they sleep.

Abu-Hassan (*ä-bō-has′an*).—As related in the *Arabian Nights*, Abou Hassan is a merchant of Bagdad who is carried in his sleep to the bed of the Caliph Haroun-al-Raschid and on awaking is made to believe himself the caliph. Twice in this way he was made to believe himself caliph and afterward became in reality the caliph's favorite and companion.

Absalom and Achitophel (*ab′sa-lom* and *a-kit′ō-fel*).—A poetical satire by John Dryden, directed against the political faction led by the Earl of Shaftesbury. The names in the title are given to the duke of Monmouth and the earl of Shaftesbury. Like Absalom, the son of David, Monmouth was remarkable for his personal beauty, his popularity, and his undutifulness to his father.

Absolute, Captain.—A character in Sheridan's comedy, *The Rivals*. He is distinguished for his gallant, determined spirit, his quickness of speech, and dry humor.

Absolute, Sir Anthony.—An amusing character in Sheridan's *Rivals*. He is represented as testy, positive, impatient, and overbearing, but yet of a warm and generous disposition.

Acadia (*a-kā′di-ä*), **Acadie** (*ä-kä-dē′*).—The original, and now the poetic, name of Nova Scotia. In 1755, the French inhabitants were seized, forcibly removed and dispersed among the English colonists on the Atlantic coast. Longfellow has made this event the subject of his poem *Evangeline*.

Acrasia (*a-krā′zi-ä*).—In Spencer's *Faërie Queene*, a witch represented as a lovely and charming woman, whose dwelling is the Bower of Bliss, which is situated on an island floating in a lake or gulf, and is adorned with everything in nature that can delight the senses. The word signifies intemperance. She is the personification of sensuous indulgence and intoxication. Sir Guyon, who illustrates the opposite virtue, is commissioned by the fairy queen to bring her into subjection, and to destroy her residence.

Acres, Bob.—A character in Sheridan's *The Rivals*, celebrated for his cowardice and his peculiar method of allegorical swearing.

Adam.—(1) Adam is a character frequently alluded to in the *Talmud*. Many strange legends are related of him. He was buried, so Arabian tradition says, on Aboncais, a mountain of Arabia. (2) In *As You Like It*, Shakespeare, he is an aged servant to Orlando and offers to accompany Orlando in his flight and to share with him his carefully-hoarded savings of five hundred pounds. (2) In Shakespeare's *Comedy of Errors*, Adam is an officer known by his dress, a skin-coat.

Adamastor (*ad-am-äs′tor*).—The phantom of the Cape of Good Hope in the *Lusiad*: a terrible spirit described by Camoens as appearing to Vasco da Gama and prophesying the misfortunes which should fall upon other expeditions to India.

Adam Bede (*bēd*).—A novel by George Eliot, the chief character of which is a young carpenter, a keen and clever workman, somewhat sharp-tempered and with a knowledge of some good books. He has an alert conscience, good common sense and "well-balanced shares of susceptibility and self-control." He loves Hetty Sorrel, but finally marries Dinah Morris.

Adams, Parson.—A character in Fielding's story of *Joseph Andrews*, distinguished for his goodness of heart, poverty, learning, and ignorance of the world, combined with courage, modesty, and a thousand oddities.

Adonais (*ad-ō-nā′is*).—An elegiac poem by Shelley, commemorating the death of Keats. The name was coined by Shelley probably to hint an analogy between Keats' fate and that of Adonis.

Advancement of Learning, The.—A prose treatise by Francis, Lord Bacon, which contains not only the germ of his Latin work, *De Augmentis Scientiarum*, but really the pith and marrow of the Baconian philosophy, if taken in connection with the second book of the *Novum Scientiarum Organum*. An analysis of the work may be read in Hazlitt's *Lectures on the Literature of the Age of Elizabeth*.

Æneid (*ē-nē′id*), or **Æneis** (*-is*).—An epic poem, in twelve books, by Vergil, recounting the adventures of Æneas after the fall of Troy, founded on the Roman tradition that Æneas settled in Latium and became the ancestral hero of the Roman people. The hero, driven by a storm on the coast of Africa, is hospitably received by Dido, queen of Carthage, to whom he relates the fall of Troy and his wanderings. An attachment between them is broken by the departure of Æneas, in obedience to the will of the gods, and the suicide of Dido follows. After a visit to Sicily, Æneas lands at Cumæ in Italy. In a descent to the infernal regions he sees his father, Anchises, and has a prophetic vision of the glorious destiny of his race as well as of the future heroes of Rome. He marries Lavinia, daughter of Latinus, king of the Latini, and a contest with Turnus, king of the Rutuli, the rejected suitor follows, in which Turnus, is slain. The poem is a glorification of Rome and of the Emperor Augustus, who, as a member of the Julian gens, traced his descent from Julus (sometimes identified with Ascanius), the grandson of Æneas.

Agamemnon (*ag-ä-mem′non*).—The greatest of the tragedies of Æschylus. The scene is laid in Argos, in the palace of Agamemnon, at the time of the king's return from the capture of Troy; the catastrophe is the murder (behind the scenes) of Agamemnon and Cassandra (whom he has brought captive with him) by the queen Clytemnestra, urged on by her paramour Ægisthus.

Agnes.—(1) A young girl in Molière's *L'Ecole des Femmes*, who affects to be remarkably simple and ingenuous. The name has passed into popular use, and is applied to any young woman unsophisticated in affairs. (2) A strong womanly character in *David Copperfield* who proves a true friend to David's "child-wife," Dora, and to David himself. Later Dora dies and David marries Agnes.

Agnes, The Eve of St.—(1) A poem by John Keats. It is characterized by Leigh Hunt as "the most delightful and complete specimen of his genius; . . . exquisitely loving; . . . young but full-grown poetry of the rarest description; graceful as the beardless Apollo; glowing and gorgeous with the colors of romance." St. Agnes

was a Roman virgin who suffered martyrdom in the reign of Diocletian. (2) A poem by Tennyson, published in 1842.

Agapida (*ă-gā-pē'thă*), **Fray Antonio.**—The fictitious writer to whom Washington Irving originally attributed the authorship of the *Conquest of Granada.*

Agib (*ā'gib*).—(1) The third Calendar in the story of "The Three Calendars" in the *Arabian Nights' Entertainments.* (2) In the story of Noureddin Ali and Bedredden Hassan in *The Arabian Nights,* a son of Bedredden Hassan and the Queen of Beauty.

Agramant (*ă'grd-mănt*).—In Boiardo's *Orlando Innamorato* and Ariosto's *Orlando Furioso,* the young king of Africa.

Ague-Cheek (*ā'gū-chēk*), **Sir Andrew.** A character in Shakespeare's comedy *Twelfth Night,* a timid, silly but amusing country squire, to whom life consists only of eating and drinking. He is stupid even to silliness, but so devoid of self-love or self-conceit that he is delightful in his simplicity.

Ahasuerus (*a-haz-ū-ē'rus*).—Chief character in Sue's *A Wandering Jew,* the cobbler who pushed away Jesus when, on the way to execution, He rested a moment or two at his door. "Get off! Away with you!" cried the cobbler. "Truly, I go away," returned Jesus, "and that quickly; but tarry thou till I come." And from that time Ahasuerus became the "wandering Jew," who still roams the earth, and will continue so to do till the "second coming of the Lord."

Ahmed (*ăh'med*), or **Achmet** (*ăch'met*).—In the *Arabian Nights,* noted for a magic tent he possessed which would cover a whole army but might be carried in the pocket. He also possessed a magic apple which would cure all diseases.

Aladdin (*a-lad'in*).—In the story of "Aladdin or the Wonderful Lamp," in the *Arabian Nights' Entertainments,* the son of a poor widow in China, who becomes possessed of a magic lamp and ring which command the services of two terrific jinns. Learning the magic power of the lamp, by accidentally rubbing it, Aladdin becomes rich and marries the Princess of Cathay through the agency of the "slave of the lamp" who also builds in a night a palace for her reception. One window of this palace was left unfinished, and no one could complete it to match the others. Aladdin therefore directs the jinns to finish it, which is done in the twinkling of an eye (hence the phrase "to finish Aladdin's window"; that is, to attempt to finish something begun by a greater man). After many years the original owner of the lamp, a magician, in order to recover it, goes through the city offering new lamps for old. The wife of Aladdin, tempted by this idea, exchanges the old rusty magic lamp for a brand new useless one (hence the phrase "to exchange old lamps for new"), and the magician transports both palace and princess to Africa, but the ring helps Aladdin to find them. He kills the magician, and, possessing himself of the lamp, transports the palace to Cathay, and at the sultan's death succeeds to the throne.

Al Araf (*ăl ă răf*).—The Mohammedan limbo, between paradise and jehennam, for those who die without sufficient merit to deserve the former, and without sufficient demerit to deserve the latter. Here lunatics, idiots, and infants go at death, according to the Koran. The subject of an uncompleted poem by Edgar A. Poe.

Alasnam (*a-las'nam*).—The hero of a story in the *Arabian Nights* entitled "The History of Prince Zeyn Alasnam and the Sultan of the Genii," Alasnam has eight diamond statues, but had to go in quest of a ninth more precious still, to fill the vacant pedestal. The prize was found in the lady who became his wife, at once the most beautiful and the most perfect of her race.

Albracca (*ăl-brăk'kă*).—In Bojardo's *Orlando Innamorato,* a castle of Cathay to which Angelica retires in grief at being scorned and shunned by Rinaldo, with whom she is deeply in love. Here she is besieged by Agricane, King of Tartary, who resolves to win her, notwithstanding her indifference to his suit.

Alceste (*ăl-sest'*).—The principal character in Molière's comedy *The Misanthrope*: a disagreeable but upright man who scorns the civilities of life and the shams of society.

Alcina (*ăl-che'na*).—A fairy, the embodiment of carnal delights, in Boiardo's *Orlando Innamorato* and Ariosoto's *Orlando Furioso* the sister of Logistalla (reason) and Morgana (lasciviousness). When tired of her lovers she changed them into trees, beasts, etc., and was finally, by means of a magic ring, displayed in her real senility and ugliness. Compare *Acrasia, Armida,* and *Circe.*

Aldine (*al'din*) **Press.**—The press established at Venice by Aldus Manutius. See *Manutius*

Aldingar (*al'ding-gär*), **Sir.**—A character in Percy's *Reliques.* This ballad relates how the honor of Queen Elianor, wife of Henry Plantagenet, impeached by Sir Aldingar, her steward, was submitted to the chance of a duel, and how an angel, in the form of a little child, appeared as her champion, and established her innocence.

Alhambra (*al-ham'brä*).—A volume of legends and descriptive sketches by Washington Irving. "The account of my midnight rambles about the old place," says the author, "literally true, yet gives but a feeble idea of my feelings and impressions, and of the singular haunts I was exploring. Everything in the work relating to myself and to the actual inhabitants of the Alhambra is unexaggerated fact; it was only in the legends tha' I indulged in *romancing,* and these were founded on material picked up about the place."

Ali Baba (*ă'lē bä'bä*).—A character in *The Arabian Nights' Entertainments,* in the story "Ali Baba and the Forty Thieves" a poor wood-cutter who, concealed in a tree, sees a band of robbers enter a secret cavern, and overhears the magic words "open sesame" which opens its door. After their departure he repeats the spell and the door opens, disclosing a room full of treasures with which he loads his asses and returns home. His brother Cassim, who discovers his secret, enters the cave alone, forgets the word "sesame," and is found and cut to pieces by the robbers. The thieves, discovering that Ali Baba knows their secret, resolve to kill him, but are outwitted by Morgiana, a slave.

Alice in Wonderland.—A little girl through whose dream pass the scenes of *Alice's Adventures in Wonderland* and *Behind the Looking-glass,* two popular stories for children by Lewis Carroll (Charles Dodgson). They have been translated into several European languages.

Alice Brand.—In Scott's *Lady of the Lake,* Alice signed Urgan the dwarf thrice with the sign of the cross, and he became "the fairest knight in all Scotland"; when Alice recognized in him her own brother.

Allan-a-Dale.—A friend of Robin Hood's in the ballad. He is introduced into Sir Walter Scott's *Ivanhoe* as Robin Hood's minstrel.

All's Well That Ends Well.—A comedy by Shakespeare. The hero and heroine are Bertram, Count of Rousillon, and Helena, a physician's daughter, who are married by the command of the king of France, but part because Bertram thought the lady not sufficiently well-born for him. Bertram flees to Florence, but, ultimately, Helena wins his love and all ends well.

Allworthy, Mr.—In Fielding's novel of *Tom Jones,* a man of amiable and benevolent character; intended for Mr. Ralph Allen, who was also celebrated by Pope.

Almighty Dollar.—A personification of American worship. Washington Irving originated the phrase in *The Creole Village.*

Alp.—*Siege of Corinth,* Byron. The hero of this poem.

Amadis de Gaul.—The hero of an ancient and celebrated Portuguese romance.

Amanda (*a-man'dä*).—A young woman who impersonates Spring in Thomson's *Seasons.*

Amaryllis, Amarillis (*am-a-ril'is*).—In Spenser's pastoral *Colin Clout's Come Home Again,* is the countess of Derby. Her name was Alice, and she was the youngest of the six daughters of Sir John Spenser, of Althorpe, ancestor of the noble houses of Spenser and Marlborough. After the death of the earl, the widow married Sir Thomas Egerton, keeper of the great seal (afterward baron of Ellesmere and viscount Brackley). It was for this very lady, during her widowhood, that Milton wrote his *Arcades.*

Ambrose.—A sharper in Lesage's *Gil Blas,* who assumed in the presence of Gil Blas the character of a devotee. He was in league with a fellow who assumed the name of Don Raphael, and a young woman who called herself Camilla, cousin of Donna Mencia. These three sharpers allure Gil Blas to a house which Camilla says is hers, fleece him of his ring, his portmanteau, and his money, decamp, and leave him to find out that the house is only a hired lodging.

Amelia (*a-mē'liä*).—The title of one of Fielding's novels, and the name of its heroine, who is distinguished for her tenderness and affection. The character of Amelia is said to have been drawn from Fielding's wife.

Amine (*ä-mēn'*).—In *Arabian Nights* a female character who leads her three sisters by her side as a leash of hounds.

Aminte (*ä-mant'*).—*Les Précieuses Ridicules,* Molière. A contradictory character in this comedy. She dismisses her admirers for proposing to marry her, scolds her uncle for not carrying himself as a gentleman, and marries a valet whom she believes to be a nobleman.

Amlet (*am'let*).—The name of a gamester in Vanbrugh's *Confederacy.*

Amoret (*am'ō-ret*).—(1) The name of a lady married to Sir Scudamore, in Spenser's *Faërie Queene.* She is the type of a devoted, loving wife. (2) The heroine of Fletcher's pastoral drama, *The Faithful Shepherdess.*

Amys and Amylion.—Two faithful friends. The Pylades and Orestes of the feudal ages. Their adventures are the subjects of ancient romances.

Ancient Man.—In Tennyson's *Idylls of the King,* means Merlin, the old magician, King Arthur's protector and teacher.

Ancient Mariner, The.—A poem by Samuel Taylor Coleridge. The hero, an ancient mariner "with a long gray beard and glittering eye," suffers terrible evils, and likewise inflicts them on his companions, from having shot an albatross, a bird of good omen. All his comrades perish of hunger, but, as he repents, he is permitted to regain the land. At intervals his agony returns, and he is driven from place to place to ease his soul by confessing his crime and sufferings to his fellows, and enforcing upon them a lesson of love for "all things, both great and small."

"*The Ancient Mariner,*" says Swinburne, "is perhaps the most wonderful of all poems. In reading it we seem rapt into that paradise revealed by Swedenborg, where music and color and perfume were one, where you could see the hues and hear the harmonies of heaven. For absolute melody and splendor it were hardly rash to call it the first poem in the language."

Andrews, Joseph.—The hero in Fielding's novel by the same name, written to ridicule Richardson's *Pamela.* Fielding presents Joseph Andrews as a brother to the modest and prudish Pamela, and pictures him as a model young man.

Angelica (*an-jel'i-kä*).—In Bojardo's *Orlando Innamorato,* is daughter of Galaphron, king of Cathay. She goes to Paris, and Orlando falls in love with her, forgetful of wife, sovereign, country and glory. Angelica, on the other hand, disregards Orlando, but passionately loves Rinaldo, who positively dislikes her. Angelica and Rinaldo drink of certain fountains, when opposite effects are produced in their hearts, for then Rinaldo loves Angelica, while Angelica loses all love for Rinaldo. (2) The heroine of Congreve's comedy of *Love for Love;* in love with Valentine, but the ward of Sir Sampson Legend, who seeks to marry her. She jilts the old man, however, and marries the younger lover. Angelica is supposed to represent Mrs. Bracegirdle; Valentine the author himself who was enamoured of the actress, and was the rival of the dramatist, Rowe, in her affections. (3) The heroine of Ariosto's *Orlando Furioso.* She was beloved by Orlando, but married Medoro. Also the name of the heroine of Farquhar's plays of the *Constant Couple,* and *Sir Harry Wildair.*

Angelic Doctor.—A name bestowed upon Thomas Aquinas, great Italian theologian and philosopher, in recognition of his virtues and talents.

Angelo (*an'je-lō*).—A character in Shakespeare's *Measure for Measure;* also the name of a goldsmith in the *Comedy of Errors.*

Angiolina.—The wife of the doge of Venice, in Byron's *Marino Faliero.*

Anna Karénina (*ăn'nä kä-rā'nē-nä*).—A novel of Tolstoy, perhaps the most representative of his works. It first appeared serially, but with long intervals, in a Moscow review, and was published in 1877.

Annabel Lee.—The title and subject of a poem by Edgar Allan Poe, which begins—

It was many and many a year ago,
In a kingdom by the sea,
That a maiden there lived whom you may know
By the name of Annabel Lee.

Anne.—Perrault's *La Barbe Bleue,* the sister of Fatima, the seventh and last wife of Bluebeard. Fatima, having disobeyed her lord by looking into the locked chamber, is allowed a short respite before execution. Sister Anne ascends the high tower of the castle, with the hope of seeing her brothers, who were expected to arrive every moment. Fatima, in her agony, keeps asking "sister Anne" if she can see them, and Bluebeard keeps crying out for Fatima to use greater dispatch. As the patience of both is exhausted the brothers arrive, and Fatima is rescued from death.

Annie Laurie, eldest of the three daughters of Sir Robert Laurie, of Maxwelton. In 1709 she married James Fergusson, of Craigdarroch, and was the mother of Alexander Fergusson, the hero of Burns' song *The Whistle.* The song of *Annie Laurie* was written by William Douglas, of Fingland, in the stewardy of Kirkcudbright, hero of the song *Willie Was a Wanton Wag.*

Antipholus of Ephesus (*an-tif'ō-lus ov ef'e-sus*), and **Antipholus of Syracuse** (*sir'a-kūs*).—Twin brothers, sons to Ægeon and Æmilia, in Shakespeare's *Comedy of Errors.*

Antonio (*ăn-tō'nē-ō*).—(1) The merchant of Venice in Shakespeare's play of that name, the friend of Bassanio, and the object of Shylock's hatred. (2) The usurping Duke of Milan, and brother to Prospero, in Shakespeare's *Tempest.* (3) The father of Proteus, in Shakespeare's *Two Gentlemen of Verona.* (4) A minor character in Shakespeare's *Much Ado About Nothing.* (5) A sea captain, friend to Sebastian, in Shakespeare's *Twelfth Night.*

Antony and Cleopatra.—Historical tragedy by Shakespeare which may be considered as a continuation of *Julius Cæsar.* In the opening scene of *Julius Cæsar* absolute power is lodged in one man. In the conclusion of *Antony and Cleopatra* a second Cæsar is again in possession of absolute power, and the entire Roman world is limited under one imperial ruler. There are four prominent characters in this play: Cleopatra, voluptuous, fascinating, gross in her faults, but great in the power of her affections; Octavius Cæsar, cool, prudent, calculating, avaricious; Antony, quick, brave, reckless, prodigal; Enobarbus, a friend of Antony, at first jocular and blunt, but transformed by penitence into a grief-stricken man who dies in the bitterness of despair.

Apocalypse.—The Greek name of the last book of the Testament, termed in English *Revelation.* It has been generally attributed to the Apostle St. John, but some wholly reject it as spurious. In the first centuries many churches disowned it, and in the fourth century it was excluded from the sacred canon by the council of Laodicea, but was again received by other councils, and confirmed by that of Trent, held in the year 1545. Most commentators suppose it to have been written after the destruction of Jerusalem, about A. D. 96; while others assign it an earlier date. Its figures and symbols are impressive.

Apocrypha (*a-pok'ri-fä*).—The word originally meant secret or hidden, and it is said that books of the *Apocrypha* are not found in either the Chaldean or the Hebrew language. These books were not in the Jewish canon, but they were received as canonical by the Catholic church, by the council of Trent. The apocryphal writings are ten in number: *Baruch, Ecclesiasticus, Wisdom of Solomon, Tobit, Judith,* two books of the *Maccabees, Song of the Three Children, Susannah,* and *Bell and the Dragon.* Their style proves that they were a part of the Jewish-Greek literature of Alexandria, within three hundred years before Christ; and as the Septuagint Greek version of the Hebrew Bible came from the same quarter, it was often accompanied by these Greek writings, and they gained a general circulation. No trace of them is found in the Talmud; they are mostly of legendary character, but some of them are of value for their historical information, their moral and maxims, and for the illustrations they give of ancient life.

Apologia pro Vita Sua: "Being a History of His Religious Opinions," published by John Henry Newman. The *Apologia* will probably never be equaled as a specimen of acute self-analysis. The only subsequent work of a similar nature with which it can be compared or associated is Mr. Gladstone's *Chapter of Autobiography,* which was designed to defend the consistency of his action in reference to the Irish church.

Arabian Nights Entertainments, consisting of one thousand and one stories, told by the sultana of the Indies to divert the sultan from the execution of a bloody vow he made to marry a lady every day and have her head cut off next morning, to avenge himself for the disloyalty of the first sultana. The story on which all the others hang is familiar. Scheherezade, the generous, beautiful young daughter of the vizier, like another Esther, resolves to risk her life in order to save the poor maidens of her city, whom the sultan is marrying and beheading at the rate of one a day. She plans to tell an interesting story each night to the sultan, breaking off in a very exciting place in order that the sultan may be tempted to spare her life so that he may hear the sequel.

Aram (*ā'ram*), **Eugene.**—A romance by Lord Lytton, founded on the story of the Knaresborough schoolmaster who committed a murder under peculiar circumstances.

Archimage (*ăr'ki-māj*), or **Archimago** (*ăr-ki-mā'gō*).—A character in Spenser's *Faërie Queene,* a hypocrite or deceiver. He is opposed to holiness embodied in the Red Cross Knight, wins the confidence of the knight in the disguise of a reverend hermit, and by the help of Duessa, or Deceit, separates him from Una, or Truth.

Barons' Wars, The.—An historical poem, in six books, by Michael Drayton. "In some historic sketches," says Campbell, "he reaches a manner beyond himself. The pictures of Mortimer and the queen, and of Edward's entrance into the castle, are splendid and spirited."

Bartholomew (*bär-thol'ō-mū*) **Fair.**—A comedy by Ben Jonson, valuable for its lively pictures of the manners of the times. It is chiefly remarkable for the exhibition of odd humors and tumblers' tricks.

Basilisco (*bas-i-lis'kō*).—*Soliman and Perseda*, old play. A boasting knight who became so popular with his foolish bragging that his name grew into a proverb.

Bassanio (*ba-sā'ni-ō*).—*Merchant of Venice*, Shakespeare. The lover of Portia who won her when he chose a leaden casket in which her portrait was hidden.

Bath, Major.—*Amelia*, Henry Fielding. A noble-minded gentleman, pompous in spite of poverty, and striving to live according to the "dignity and honor of man." He tries to hide his poverty under bold speech even when found doing menial service.

Battle, Sarah.—*Essays of Elia*, Lamb. Sarah considered whist the business of life and literature one of the relaxations. When a young gentleman, of a literary turn, said to her he had no objection to unbend his mind for a little time by taking a hand with her, Sarah declared, "Whist was her life business; her duty; the thing she came into the world to do. She unbent her mind afterward over a book."

Beatrice (*bē'a-tris*, or *-trēs*).—*Divine Comedy*, Dante. Daughter of an illustrious family of Florence for whom Dante had a great love. In his poem she is represented as being his guide through paradise. Beatrice is also the name of the heroine of Shakespeare's *Much Ado About Nothing*.

Beauty and the Beast.—Fairy tale by Mme. Villeneuve. Oft repeated in stories for children, *Beauty and the Beast* are known in many forms. In the original tale young and lovely Beauty saved the life of her father by putting herself in the power of a frightful but kind-hearted monster, whose respectful affection and deep melancholy finally overcame her aversion to his hideousness, and induced her to consent to marry him. By her love Beast was set free from enchantment and allowed to assume his own form, a handsome and graceful young prince.

Bede, Adam.—*Adam Bede*, George Eliot. An ideal workman, hero of the novel.

Bedivere (*bed'i-vēr*).—*Tales of the Round Table*. Bedivere was the last knight of King Arthur's Round Table.

Beggar's Opera, The, by John Gay, first acted at Lincoln's Inn Fields, in 1727, is the first, and perhaps the best, specimen of English ballad opera. It was acted in London amid unprecedented applause, and obtained scarcely less popularity through the provinces. It was said that it made Rich, the manager, gay; and Gay, the poet, rich. Hazlitt says of the *Opera*, that "it is indeed a masterpiece of wit and genius, not to say of morality."

Belarius (*be-lā'ri-us*).—A nobleman and soldier in the army of Cymbeline, king of Britain.

Belch (*belch*), **Sir Toby.**—*Twelfth Night*, Shakespeare. Uncle to Olivia, a jolly, carefree fellow, type of the roysterers of Queen Elizabeth's days.

Belinda (*be-lin'dā*).—*Rape of the Lock*, Pope. Poetical name of the heroine, whose real name was said to be Arabella Fermor. In a frolic Lord Petre cut a lock from the lady's hair. This was so much resented that it broke the great friendship between the two families. The poem, *Rape of the Lock*, was written to bring the people into a better temper and lead to reconciliation. Belinda is also the name of the heroine in a novel written by Maria Edgeworth.

Bell, Adam.—*Old Ballad*. A famous wild outlaw belonging to the north country and celebrated for his skill as an archer.

Bell, Laura.—*Pendennis*, Thackeray. One of the sweetest heroines in English literature.

Bellman.—*L'Allegro*, Milton. The watchman who patrolled the streets and called out the hour of night. Sometimes he repeated scraps of pious poetry in order to charm away danger.

Bell-the-Cat.—Name given to a nobleman at Lauder, Scotland, early in the sixteenth century. King James II. called an assembly of Scottish barons to resist a threatened invasion of his realm by Edward IV. of England. After long discussion one of the barons related the nursery tale of a convention of mice in which it was proposed to hang a bell on the cat's neck, to give warning of her presence. No one would serve on the mouse committee. To the story Archibald Douglas responded by saying, "I will bell the cat," and was afterward known by the name, Bell-the-Cat.

Belphœbe (*bel-fē'bē*).—*Faërie Queene*, Spenser. A delicate and graceful flattery offered to Queen Elizabeth through the huntress, Belphœbe, intended as a likeness of the queen. The name taken from belle, meaning beautiful, and Phœbe, a name sometimes bestowed on Diana.

Belvawney, Miss.—*Nicholas Nickleby*, Dickens. She belonged to the wonderful Portsmouth theater, always took the part of a page and gloried in silk stockings.

Belvidera (*bel-vē-dā'rā*).—*Venice Preserved*, Otway. The beautiful heroine of the almost forgotten tragedy. Sir Walter Scott said "more tears have been shed, probably, for the sorrows of Belvidera and Monimia than for those of Juliet and Desdemona."

Benedick (*ben'ē-dik*).—*Much Ado About Nothing*, Shakespeare. A young lord of Padua who is gentleman, wit, and soldier. He was a pronounced bachelor, but after a courtship full of witty sayings and coquetry he marries the lovely Beatrice. From this gentleman comes the name Benedick or Benedict, applied to married men who were not going to marry.

Benengeli (*ben-en-gē'lē*), **Cid Hamet.**—*Don Quixote*, Cervantes. Supposed to be a writer of chronicles among the Moors and claimed as authority for the tales of adventure recorded by Cervantes. The name, Cid Hamet, has been often quoted by writers.

Ben Hur.—A novel by General Lew Wallace. Messala, the Roman playmate and young friend of Ben Hur, afterward became his remorseless enemy. Ambitious, hard, and cruel, when he came into power he made Ben Hur a galley slave, confiscated his property and imprisoned the mother and sister. Ben Hur escaped, returned later as a wealthy Roman, and entered in the famous chariot race against Messala, who had put up enormous sums in wagers. Messala recognized Ben Her, and hoped to win the race and bring him to final ruin; but Messala himself was thrown and seriously injured. His cruelties were made known, and he was at last slain by his wife, Isas, the daughter of Balthasar.

Bennet, Mrs.—*Amelie*, Fielding. An improper character.

Benvolio (*ben-vō'li-ō*).—*Romeo and Juliet*, Shakespeare. One of Romeo's friends who would "quarrel with a man that had a hair more or a hair less in his beard than he had." Mercutio says to him, "Thou hast quarreled with a man for coughing in the street."

Beowulf (*bā'ō-wulf*).—The name of an Anglo-Saxon epic poem of the sixth century. It received its name from Beowulf, who delivered Hrothgar, King of Denmark, from the monster Grendel. This Grendel was half monster and half man, and night after night stole into the king's palace, called Heorot, and slew sometimes as many as thirty of the sleepers at a time. Beowulf put himself at the head of a mixed band of warriors, went against the monster and slew it. This epic is very Ossianic in style, full of beauties, and most interesting.

Bertram (*ber'tram*).—*Guy Mannering*, Scott. The character was suggested by James Annesley, Esq., rightful heir of the earldom of Anglesey, of which he was dispossessed by his uncle Richard. He died in 1743. Bertram was also the name of the haughty and dissolute count, husband of Helena in Shakespeare's comedy *All's Well That Ends Well*.

Bianca (*bi-an'kā*).—(1) The youngest daughter of Baptista of Padua, as gentle and meek as her sister Katherine was violent and irritable. (2) The sweetheart, "almost" wife of Cassio, in Shakespeare's *Othello*.

Biglow Papers, The.—A series of satirical poems, in the quaint Yankee dialect, ascribed to a certain Hosea Biglow, but really written by the American poet, James Russell Lowell.

Birch, Harvey.—*The Spy*, Cooper. The chief character of the novel.

Biron (*bē-rôn'*).—*Love's Labor's Lost*, Shakespeare. A merry madcap young lord, in attendance on Ferdinand, king of Navarre.

Black-Eyed Susan.—*Ballad*, John Gay. The heroine of the popular sea song.

Black Knight of the Black Lands.—Sir Peread. Called by Tennyson *Night* or *Nox*. He was one of the four brothers who kept the passages of Castle Dangerous, and was overthrown by Sir Gareth. *Idylls* (*Gareth and Lynette*).

Blatant Beast.—*Faërie Queene*, Spenser. A bellowing monster typical of slander; or, an impersonation of what we now call *Vox Populi*, or the *Voice of the People*.

Bleak House.—A novel by Charles Dickens, the title of which was suggested, it is said, by the situation of a certain tall brick house at Broadstairs, which stands high above and far away from the remainder of the town, and in which the author resided for several seasons.

Blimber (*blim'er*), **Miss Cornelia.**—*Dombey and Son*, Dickens. The daughter of Dr. Blimber, the head of a first-class educational establishment conducted on the forcing, or cramming, principle. She is a very learned, grave, and precise young lady, "no light nonsense about her," who has become "dry and sandy with working in the graves of deceased languages."

Blithedale (*blīth'dāl*) **Romance, The.**—A story by

Nathaniel Hawthorne, founded on the author's experience as a member of the Brook Farm community. "Its predominant idea," says R. H. Hutton, "is to delineate the deranging effect of an absorbing philanthropic idea on a powerful mind; the unscrupulous sacrifices of personal claims which it induces, and the misery in which it ends. There is scarcely one *incident* in the tale properly so called except the catastrophe."

Blowzelinda (*blou-ze-lin'dä*), or **Blowsalinda** (*blou-za-lin'dä*).—*Shepherd's Week*, John Gay. The country girl, heroine of this pastoral poem, written more than one hundred and fifty years ago, but quoted as a picture of the poverty and rudeness of rural life at that time.

Bobadil (*bob'a-dil*), **Captain.**—*Every Man in His Humor*, Jonson. A boasting coward, who passes himself off with young and simple people for a Hector.

Bœuf, Front de (*beuf, fron du*).—*Ivanhoe*, Scott. One of King John's followers. A ferocious scoundrel.

Bois-Guilbert (*bwa'gel-bär'*), **Brian de.**—*Ivanhoe*, Scott. A brave but cruel, crafty, and dissolute commander of the Knights Templar.

Boniface (*bon'i-fās*).—*The Beaux's Stratagem*, Farquhar. A fine representation of an English landlord. Hence applied to landlords generally.

Bontemps (*bôn-ton'*), **Roger.**—*Song*, Beranger. Known in France as the personification of care-free leisure. The equivalent, among the French peasantry, for the English proverb, "There's a good time coming," is *Roger Bontemps*. This one of Beranger's most celebrated songs was written in 1814.

Bottom, Nick.—*A Midsummer Night's Dream*, Shakespeare. A man who fancies he can do everything, and do it better than anyone else. Shakespeare has drawn him as profoundly ignorant and with an overflow of self-conceit. Oberon, the fairy king, desiring to punish Titania, his queen, commissioned Puck to watch her till she fell asleep, and then to anoint her eyelids with the juice of a plant called "love-in-idleness," the effect of which, when she awoke, was to make her dote upon Bottom, upon whom Puck had fixed an ass's head.

Bourgeois Gentilhomme, Le (*bōōr-zhwä' zhon-tē-yōm' lŭ*).—A comedy by Molière, with music by Lulli, produced in 1670. The hero is a tradesman, M. Jourdain, who is ambitious to marry his daughter to a titled husband.

Bowling, Tom.—*Roderick Random*, Smollett. A name made almost famous as hero of the novel. Critics have said, "The character of Tom Bowling, in *Roderick Random* will be regarded in all ages as a happy exhibition of those naval heroes to whom Britain is indebted for so much of her happiness and glory." The Tom Bowling referred to in Dibdin's famous sea song was Captain Thomas Dibdin, brother of Charles Dibdin, who wrote the song.

Boz (*boz*), **Sketches by.**—By Charles Dickens. They were the first of their class. Dickens was the first to unite the delicately playful thread of Charles Lamb's street musings—half experiences, half bookish fantasies—with the vigorous wit and humor and observation of Goldsmith's *Citizen of the World*, his *Indigent Philosopher*, and *Man in Black*, and twine them together in the golden cord of essay, which combines literature with philosophy, humor with morality, amusement with instruction. The most powerful and popular of the sketches are probably those entitled, *A Visit to Newgate, The Drunkard's Death, Election for Beadle, Greenwich Fair*, and *Miss Evans at the Eagle*.

Bracebridge Hall, or *The Humorists*.—Miscellaneous sketches, in fiction and essay, by Washington Irving, published in 1822.

Brag, Jack.—*Jack Brag*, Theodore Hook. Hero of the novel and a spirited embodiment of the arts employed by a vulgar pretender to creep into aristocratic society, and of his ultimate discomfiture. General Burgoyne figures in an old ballad known as *Sir Jack Brag*.

Bramble, Matthew.—*Humphrey Clinker*, Smollett. Noted character in the novel described as "an odd kind of humorist," afflicted with the gout, and "always on the fret," but full of generosity and benevolence.

Brass, Sally, and Sampson.—*Old Curiosity Shop*, Dickens. Brother and sister, well mated, he a shystering lawyer and she getting ahead of him in villainy. Sampson was dishonest, sentimental, and affected in manner, and both are interesting characters to read about.

Brentford (*brent'fōrd*), **The Two Kings of.**—*The Rehearsal*, Villiers. Much question has been raised as to who was to be ridiculed under these characters. The royal brothers, Charles II. and James II., have been suggested; others say the fighting kings of Granada. In the farce the two kings are represented as walking hand in hand, as dancing together and singing in concert.

Briana (*brī-ā'nä*).—Spenser's *Faërie Queene*. The lady of a castle who demanded for toll the locks of every lady and the beard of every knight that passed. This toll was established because Sir Crudor, with whom she was in love, refused to marry her till she had provided him with human hair sufficient to purfle a mantle with. Sir Crudor, having been overthrown in knightly combat by Sir Calidore, who refused to give the passage pay, is made to release Briana from the condition imposed on her, and Briana swears to discontinue the discourteous toll.

Brick, Jefferson.—In Dickens' *Martin Chuzzlewit*. A very weak, pale young man, the war correspondent of the *New York Rowdy Journal*, of which Colonel Diver was editor.

Bride of Abydos, The.—A Turkish tale, told in octosyllabic verse by Lord Byron, and published in 1813. It is in two cantos, and opens with the well-known song imitated from Goethe, beginning: "Know ye the land where the cypress and myrtle." The name of the "bride" is Zuleika, and that of her lover, Selim.

Bride of Lammermoor, The.—A romance of Sir Walter Scott, published in 1819, and characterized as a tragedy of the highest order, uniting excellence of plot with Scott's usual merits of character and description.

Brook Farm.—The full name was "Brook Farm Institute of Agriculture and Education," a stock company of nearly seventy members, located on a farm of two hundred acres at West Roxbury, Mass. Among the members were George Ripley, Charles A. Dana, George William Curtis, Margaret Fuller and Nathaniel Hawthorne. Among their frequent visitors were Ralph Waldo Emerson, Theodore Parker, Bronson Alcott. This idyllic life lasted about five years, from 1841 to 1846. Brook Farm was a financial failure but it was important in intellectual results. Hawthorne has written the story of the experiment in *Blithedale Romance*.

Brown, Tom.—*Tom Brown's School Days* and *Tom Brown at Oxford*, Thomas Hughes. The hero of these stories of school days, a typical English schoolboy and undergraduate.

Brunhild (*brōn'hild*).—*Nibelungenlied*. The story of Brunhild holds large place in ancient German romance. She was, herself, a warrior, proud and skillful, and she promised to be the bride of the man who could conquer her in three trials, in hurling the lance, in throwing the stone, and in leaping after the stone when thrown. By the arts and bravery of Siegfried, she was deluded into marrying Gunther, king of Burgundy; but, discovering the trick, she planned and accomplished the destruction of Siegfried, and the humiliation of Chriemhild, his wife.

Bumble, Mr.—*Oliver Twist*, Dickens. A pompous, disagreeable beadle, who figures largely in the beginning of the story. The name Bumble has since attached itself to the office.

Bunsby (*bunz'bi*), **Jack.**—*Dombey and Son*, Dickens. A commander of a ship looked up to as an oracle by his friend Captain Cuttle. He is described as wearing a "rapt and imperturbable manner," and seeming to be "always on the lookout for something in the extremest distance."

Bunthorne (*bun'thôrn*).—*Patience*, Sullivan. A gloomy poet showing most distinctly in his gloom surrounded by the characters of a comic opera. He was inserted as a satire on the æsthetic craze, turning into ridicule the imitators of Rossetti.

Burchell (*ber'chel*), **Mr.**—*Vicar of Wakefield*, Goldsmith. A prominent character who passes himself off as a poor man, but is really a baronet in disguise. He is noted for his habit of crying out "Fudge!" by way of expressing his strong contempt for the opinions of others.

Burd Helen.—*Scotch Ballad*. A traditional name standing for constancy. She was carried to England by fairies and imprisoned in a castle. The youngest brother of the fair Burd Helen was guided by the enchanter Merlin and accomplished the perilous task of rescuing his sister. This is recited in the line "Childe Rowland to the dark tower came," quoted by Shakespeare. Only a fragment of the old ballad has been preserved.

Buskin.—Tragedy. The Greek tragic actors used to wear a sandal some two or three inches thick, to elevate their stature. To this sole was attached a very elegant buskin.

Buzfuz, (*buz'fuz*) **Serjeant.**—*Pickwick Papers*, Dickens. A pompous, chaffing lawyer, who bullies Mr. Pickwick and the witnesses in the famous breach of promise suit, Bardell vs. Pickwick.

Byfield.—A New England parish, the scene of an historical novel by John Lewis Ewell. Here lived the ancestor of Longfellow to whom the poet dedicated *The Village Blacksmith*, himself a blacksmith, keeping his accounts in peculiar orthography. According to the deed of sale in 1681, the Byfield Indians got a larger price from the first English settlers than was paid for Manhattan Island.

C

Caius (*kā'yus*), **Doctor.**—*Merry Wives of Windsor*, Shakespeare. A physician in the comedy who adds a touch of humor. He is most conspicuous as the lover of Anne Page.

Calandrino (*kä-lăn-drē'nō*).—A simpleton frequently introduced in Boccaccio's *Decameron;* expressly made to be befooled and played upon. His mishaps, as Macaulay states, "have made all Europe merry for more than four centuries."

Caleb.—(1) The enchantress who carried off St. George in infancy. (2) A character in Dryden's satire of *Absalom and Achitophel*, meant for Lord Grey, one of the adherents of the Duke of Monmouth.

Caleb Quotem.—A parish clerk or jack-of-all-trades, in Coleman's play *The Review, or Ways of Windsor*. Coleman borrowed the character from *Throw Physic to the Dogs*, an old farce.

Caliban (*kal'i-ban*).—A savage and deformed slave of Prospero in Shakespeare's *Tempest*. He is represented as being the "freckled whelp" of Sycorax, a foul hag, who was banished from Argier (or Algiers) to the desert island afterward inhabited by Prospero. From his rude, uncouth language we get the phrase "Caliban style," "Caliban speech," meaning the coarsest possible use of words.

Calidore (*kal'i-dōr*).—A knight in Spenser's *Faërie Queene*, typical of courtesy, and said to be intended for a portrait of Sir Philip Sidney.

Calista.—The name of a celebrated character in Rowe's *Fair Penitent*.

Callipolis (*ka-lip'o-lis*).—*Battle of Alcazar*, George Peele. A character in the *Battle of Alcazar*, used by Sir Walter Scott and others as a synonym for lady-love, sweetheart, charmer. Sir Walter always spells the word Callipolis, but Peele calls it Calipolis.

Calydon (*kal'i-don*).—A forest celebrated in the romances relating to King Arthur and Merlin.

Camaralzaman, Prince.—*Arabian Nights*.—One of the stories of the *Arabian Nights* and the name of a prince who fell in love with Badoura, princess of China, the moment he saw her.

Camancho (*kä-mä'chō*).—*Don Quixote*, Cervantes. A character in an episode in *Don Quixote*, who gets cheated out of his bride after having made great preparations for their wedding.

Camballo (*kam-bal'o*), or **Cambel.**—*Faërie Queene*, Spenser. A brother of Candace. He challenged every suitor to his sister's hand, and overthrew all except Triamond, who married the lady.

Cambalu.—In the *Voyages* of Marco Polo the chief city of the province of Cathay.

Cambuscan (*kam-bus-kan'*, or *kam-bus'kan*).—A Tartar king identical with Genghis Khan. The king of the Far East sent Cambuscan a "steed of brass, which, between sunrise and sunset, would carry its rider to any spot on the earth." All that was required was to whisper the name of the place in the horse's ear, mount upon his back, and turn a pin set in his ear. When the rider had arrived at the place required, he had to turn another pin, and the horse instantly descended, and, with another screw of the pin, vanished till it was again required. This story is begun by Chaucer in the *Squire's Tale*, but was never finished.

Camelot (*kam'e-lot*).—A parish in Somersetshire, England (now called Queen's Camel), where King Arthur is said to have held his court. In this place there are still to be seen vast intrenchments of an ancient town or station—called by the inhabitants "King Arthur's Palace."

Camilla (*ka-mil'ä*).—(1) The virgin queen of the Volscians, famous for her fleetness of foot. She aided Turnus against Æneas. (2) Wife of Anselmo of Florence in *Don Quixote*. Anselmo, in order to rejoice in her incorruptible fidelity, induced his friend Lothario to try to corrupt her. This he did, and Camilla was not trial-proof, but fell. Anselmo for a time was kept in the dark, but at the end Camilla eloped with Lothario. Anselmo died of grief, Lothario was slain in battle, and Camilla died in a convent.

Camille (*kä-mēl'*).—(1) In Corneille's tragedy of *Les Horaces*. When her brother meets her and bids her congratulate him for his victory over the three curiatii, she gives utterance to her grief for the death of her lover. Horace says, "What! can you prefer a man to the interests of Rome?" Whereupon Camille denounces Rome, and concludes with these words: "Oh, that it were my lot!" (2) Whitehead dramatized the subject and called it *The Roman Father*.

Canace (*kan'a-se*).—*Faërie Queene*, Spenser. A paragon among women, the daughter of King Cambuscan, to whom the king of the East sent as a present a mirror and a ring. The mirror would tell the lady if any man on whom she set her heart would prove true or false, and the ring (which was to be worn on her thumb) would enable her to understand the language of birds and to converse with them. Canace was courted by a crowd of suitors, but her brother gave out that anyone who pretended to her hand must encounter him in single combat and overthrow him. She ultimately married Triamond, son of the fairy, Agapë.

Candide (*kāN-dēd'*), **ou l'Optimisme** (*ōō lop-tē-mēzm'*).—A philsosphical novel by Voltaire, published in 1759. It is named from its hero, who bears all the worst ills of life with a cool, philosophical indifference, laughing at its miseries. Written ostensibly to ridicule philosophical optimism, and on the spur given to pessimist theories by the Lisbon earthquake, *Candide* is really as comprehensive as it is desultory. Religion, political government, national peculiarities, human weakness, ambition, love, loyalty—all come in for the unfailing sneer. The moral, wherever there is a moral, is, "Be tolerant, and *cultivez vôtre jardin"*; that is to say, Do whatsoever work you have to do diligently.

Candor, Mrs.—A most energetic slanderer in Sheridan's *School for Scandal*.

Canterbury Tales, The, by Geoffrey Chaucer, consist of a *Prologue* and twenty-four narratives of which only two, *Chaucer's Tales of Melibœus* and *The Parson's Tale*, are in prose, the remainder being written in couplets of ten syllables, which have laid the foundation for the most popular form of English verse.

The plan of the poem is as follows: The author supposes that, on the evening before he starts on a pilgrimage to the shrine of St. Thomas-à-Becket, at Canterbury, he stops at the Tabard Inn, in Southwark, where he finds himself in the midst of a company of twenty-one, of all ranks and ages and both sexes, who are also bound for the same destination. After supper, the host of Tabard, Harry Baillie by name, proposes that, to beguile the journey there and back, the pilgrims shall each of them tell two tales as they come and go; and that he who by the general voice shall have told his story best, shall, on their return to the hostelry, be treated to a supper at the common cost. This is agreed to with acclamation; and, accordingly, the pilgrims start next morning on their way, listening, as they ride, to the heroic tale of the brave and gentle knight who has been chosen to narrate the first tale.

It will be understood that Chaucer does not profess to give to the world all the stories told. As a matter of fact, he gives only twenty-four, of which two have been already named, the remainder being those told by the Knight, the Miller, the Reeve, the Cook, the Man of Law, the Wife of Bath, the Friar, the Sompnour, the Clerk, the Squire, the Franklin, the Doctor, the Pardoner, the Shipman, the Prioress, the Monk, the Nun's Priest, the second Nun, the Canon's Yeoman, the Manciple, and Chaucer himself (Sir Topas). Unfinished, as it is, however, the poem was immensely popular, even in the author's time; and it was one of the first books that was issued from the press of Caxton, probably in 1475.

Caora (*kä'ō-rä*).—*Description of Guiana*, Raleigh. A river on the banks of which are a people whose heads grow beneath their shoulders. Their eyes are in their shoulders, and mouths in the middle of their breasts. The original picture is found in Hakluyt's *Voyages*, 1598.

Capulet (*kap'ū-let*).—The head of a noble Veronese house in Shakespeare's tragedy of *Romeo and Juliet*, hostile to the house of Montague. He is at times self-willed and tyrannical, but a jovial and testy old man.

Capulet, Lady.—The proud and stately wife of Capulet, and mother of Juliet.

Caradoc (*kar'a-dok*).—A knight of the Round Table. Also, in history, the British chief whom the Romans called Caractacus. Caradoc is the hero of an old ballad entitled *The Boy and the Mantle*.

Carker (*kär'ker*).—A scoundrelly clerk in Dickens' *Dombey and Son*.

Carton, Sidney.—A hero transformed by unselfish love in Dickens' *Tale of Two Cities*. He voluntarily goes to the guillotine to save his successful rival in love.

Casca (*kas'kä*).—*Julius Cæsar*, Shakespeare. A blunt-witted Roman, one of the conspirators against Julius Cæsar.

Cassandra (*ka-san'drä*).—A daughter of Priam, king of Troy, gifted with the power of prophecy; but Apollo, whom she had offended, brought it to pass that no one believed her predictions. Shakespeare makes use of this character in *Troilus and Cressida*.

Cassibelan.—Great uncle to Cymbeline, in Shakespeare's play by that name.

Cassio (*kash'iō*).—A Florentine, and lieutenant of Othello, and a tool of Iago, in Shakespeare's tragedy of *Othello*. Iago made Cassio drunk, and then set on Roderigo to quarrel with him. Cassio wounded Roderigo. Othello suspended Cassio, but Iago induced Desdemona to plead for his restoration. This interest in Cassio confirmed the jealous rage of Othello to murder Desdemona and kill himself. After the death of Othello, Cassio was appointed governor of Cyprus.

Castle Dangerous.—A keep belonging to the Douglas family, which gives its name to one of Sir Walter Scott's *Tales of My Landlord*. It was so called by the English because it was always retaken from them by the Douglas.

Castle of Indolence.—The title of a poem by Thomson, and the name of a castle, described in it as situated in a pleasing land of drowsiness, where every sense was steeped in the most luxurious and enervating delights.

Castlewood, Beatrix.—The heroine of Thackeray's novel *Henry Esmond*, a picture of splendid, lustrous, physical beauty.

Caudle, Mrs. Margaret.—The feigned author of a series of curtain lectures by Douglas Jerrold, published in *Punch*, purporting to be the lectures delivered by Mrs. Margaret Caudle to her patient husband, Job Caudle, between the hours of ten at night and seven in the morning.

Cauline, Sir.—A knight in Percy's *Reliques*, who served the wine to the king of Ireland. He fell in love with Christabelle, the king's daughter, and she became his troth-plight wife, without her fathe'rs knowledge. When the king knew of it, he banished Sir Cauline. After a time the soldain asked the lady in marriage, but Sir Cauline challenged his rival and slew him. He himself, however, died of the wounds he had received, and the Lady Christabelle, out of grief, "burst her gentle hearte in twayne."

Cecilia, St.—A patron saint of the blind, also patroness of musicians, and "inventor of the organ." According to tradition, an angel fell in love with her for her musical skill, and used nightly to visit her.

Celadon (*sel'a-don*) **and Amelia.**—Lovers of matchless beauty and most devoted to each other. Being overtaken by a thunderstorm, Amelia became alarmed, but Celadon, folding his arm about her, said, "'Tis safety to be near thee, sure"; but while he spoke Amelia was struck by lightning and fell dead in his arms.

Celia.—*Faërie Queene*, Spenser. (1) Mother of Faith, Hope and Charity. She was herself known as Heavenliness and lived in the hospices Holiness. (2) Celia, cousin to Rosalind in Shakespeare's comedy *As You Like It*. Celia is a common poetical name for a lady or a lady-love.

Chadband (*chad'band*), **The Rev.**—A clerical character in Dickens' *Bleak House*. He will always stand as a type of hypocritical piety.

Chanticleer (*chan'ti-klēr*).—The cock in the tale of *Reynard the Fox*, and in Chaucer's *Nonne Prestes Tale*.

Charlemagne (*chär'le-mān*).—The romance of Charlemagne and his paladins is of French origin, as the romances of King Arthur and the Knights of the Round Table is of Celtic or Welsh origin. According to one tradition Charlemagne is not dead, but waits, crowned and armed, in Odenberg, near Saltzburg, till the time of the antichrist, when he will wake up and deliver Christendom. According to another tradition, Charlemagne appears in seasons of plenty. He crosses the Rhine on a golden bridge, and blesses both cornfields and vinyards.

Charmian (*chär'mi-an*).—A kind-hearted but simple-minded female attendant on Cleopatra in Shakespeare's play of *Antony and Cleopatra*.

Cheeryble (*chēr'i-bl*) **Brothers, The.**—A firm of benevolent London merchants in Dickens' *Nicholas Nickleby*.

Chery and Fair-Star.—*Countess d'Aulnoy's Fairy Tales*. Two children of royal birth, whom their father's brothers and their mother's sisters cast out to sea; they are found and brought up by a corsair and his wife. Ultimately they are told of their birth by a green bird and marry each other. A similar tale is found in *The Arabian Nights*.

Chibiabos.—The musician in Longfellow's *Hiawatha*, personifying harmony in nature.

Childe Harold's Pilgrimage.—A poem, in the Spenserian stanza, by Lord Byron. It consists of four cantos, of which the first and second were published in 1812, the third in 1816, and the fourth in 1818; and the preface to the first two cantos contained the following explanation of the origin and purpose of the poem.

"It was written," says Lord Byron, "for the most part, amid the scenes which it attempts to describe. It was begun in Albania; and the parts relative to Spain and Portugal were composed from the author's observations in those countries. . . . the scenes attempted to be sketched are in Spain, Portugal, Epirus, Acarnania, and Greece (the third canto describes scenes in Belgium, Switzerland, and the Valley of the Rhine; and canto four is chiefly occupied with Rome) . . . A fictitious character is introduced for the sake of giving some connection to the piece, which, however, makes no pretensions to regularity. It has been suggested to me by friends, on whose opinion I set a high value, that in this fictitious character, Childe Harold, I may incur the suspicion of having intended some real personage; this I beg leave, once for all, to disclaim. Harold is the creation of imagination, for the purpose I have stated. In some trivial particulars, and those merely local, there might be grounds for such a notion; but in the main points, I should hope, none whatever. It is almost superfluous to mention that the appellation 'Childe' is used as more consonant with the old structure of versification which I have adopted."

Children in the Wood.—Two characters in an ancient and well-known ballad entitled *The Children in the Wood*, or *The Norfolk Gent's Last Will and Testament*. This is said to be a disguised recital of the alleged murder of his nephews by Richard III.

Chillingly, Kenelm.—The hero in a novel by this name by Bulwer.

Chillon (*shē-yōn*), **The Prisoner of.**—A poem by Lord Byron, founded on the story of Francois de Bonnivard, the hero of Genevan independence, and published in 1816. Bonnivard was born in 1496, and died in 1571. An account of his life, in France, is prefixed to the poem.

Chingachgook.—A sagamore of the Mohicans and father of Uncas, in Cooper's *Leather-Stocking Tales*.

Chloe (*klō'ē*).—*Daphnis and Chloe*, Longus. (1) The shepherdess loved by Daphne. (2) *Paul and Virginia* by St. Pierre is founded on this romance. (3) Chloe is also a shepherdess in Shakespeare's *As You Like It*.

Chœreas.—The lover of Callirrhoë, in Chariton's Greek romance.

Chriemhild, or **Kriemhild** (*krēm'hild*).—The heroine of the German epic poem, the *Nibelungenlied*. She is represented as a woman of the rarest grace and beauty, and rich beyond conception. By the treacherous murder of her husband she is transformed into a furious creature of revenge. For plot of this epic cycle, see "Kriemhild."

Christabel (*kris'ta-bel*).—(1) The subject and heroine of an old romance by Sir Eglamour of Artois. (2) The heroine of an ancient ballad *Sir Cauline*. (3) The lady in Coleridge's poem *Christabel*.

Christian (*kris'tian*).—The hero of John Bunyan's allegory *Pilgrim's Progress*. He flees from the "City of Destruction," and journeys to the "Celestial City." He starts with a heavy burden on his back, but it falls off when he stands at the foot of the cross. All his trials on the way are depicted.

Christiana (*kris-tē-a'nä*).—The wife of Christian, who, starting with her children and Mercy from the "City of Destruction," forms the subject of Bunyan's *Pilgrim's Progress*, part II. She was placed under the guidance of Mr. Great-Heart, and met her husband at the Celestial City.

Christmas Carol, A.—A ghost story of Christmas, by Charles Dickens, published in 1843, with illustrations by John Leech. "We are all charmed," wrote Lord Jeffrey to the author, "with your *Carol*, chiefly, I think, for the genuine goodness which breathes all through it, and is the true inspiring angel by which its genius has been awakened. The whole scene of the Cratchits is like the dream of a benevolent angel, in spite of its broad reality, and little Tiny Tim in life and death almost as sweet and touching as Nelly."

Christmas Eve.—A poem by Robert Browning, in which, "after following through a long course of reflection the successive phases of religious belief, he arrives at the certainty that, however confused be the vision of Christ, where His love is, there is the Life; and that, the more direct the revelation of that Love, the deeper and more vital is its power."

Christopher, St.—The giant that carried a child over a brook, and said, "Chylde, thou has put me in grete peryll. I might bere no greater burden." The Chylde was the Christ and the burden was the "Sin of the World." This has been a favorite theme for painters.

Chrysalde (*krē-zäld'*).—A character in Molière's *L'Ecole des Femmes;* a friend of Arnolphe.

Chrysale (*krē-zäl'*).—An honest, simple-minded, henpecked tradesman, in the same comedy by Molière.

Chuzzlewit, Martin.—The hero of Dickens' novel of the same name. The story is remarkable for the attention it directed to the system of ship hospitals and to the workhouse nurses whose prototype in Sarah Gamp has become famous all over the world.

Chuzzlewit, Jonas.—A miser and a murderer, the opposite type of character from Martin.

Cimmerians (*si-mē'ri-anz*).—A people described by Homer dwelling "beyond the ocean stream," in a land where the sun never shines.

Cinderella.—Heroine of a fairy tale. She is the drudge of the house, while her elder sisters go to fine balls. At length a fairy enables her to go to the prince's ball; the prince falls in love with her, and she is discovered by means of a glass slipper which she drops, and which will fit no foot but her own. She is represented as returning good for evil and heaping upon her half-sisters every kindness a princess can show.

Cipango (*si-pang'gō*).—A marvelous island, described in the *Voyages* of Marco Polo, the Venetian traveler. It is represented as lying in the Eastern seas, some one thousand five hundred miles from land, and of its beauty and wealth many stories are related. Columbus made a diligent search for this island.

Clärchen (*klār'chen*).—A female character in Goethe's *Egmont*, noted for her constancy and devotion.

Clare, Ada.—The wife of Carstone, and one of the most important characters in Dickens' *Bleak House.*

Clavileño (*klä-vē-lān'yō*), **El Alígero.**—The wooden horse on which Don Quixote got astride in order to disenchant the Infanta Antonomasia, her husband, and the Countess Trifaldi. It was "the very horse on which Peter of Provence carried off the fair Magalona, and was constructed by Merlin." This horse was called Clavileño, or Wooden Peg, because it was governed by a wooden pin in the forehead.

Cléante (*klā-ont'*).—Brother-in-law of Orgon in Molière's *Tartuffe.* He is distinguished for his genuine piety, and is both high-minded and compassionate. The same name occurs in two other plays by Molière.

Cleishbotham (*klēsh'boтн-am*), **Jedediah.**—Schoolmaster and parish clerk of Gandercleuch, who employed his assistant teacher to arrange and edit the tales told by the landlord of the Wallace inn of the same parish. These tales the editor disposed in three series, called by the general title of *The Tales of My Landlord.* Of course the real author is Sir Walter Scott.

Clementina, Lady.—A beautiful and accomplished woman, deeply in love with Sir Charles Grandison, in Richardson's novel of this name.

Cleon (*klē'on*).—(1) In Shakespeare's *Pericles*, governor of Tarsus, burned to death with his wife Dionysia by the enraged citizens, to revenge the supposed murder of Marina, daughter of Pericles, prince of Tyre. (2) The personification of glory in Spenser's *Faërie Queene.*

Clifford, Paul.—An attractive highwayman and an interesting hero in Bulwer's novel by the same name. He is familiar with the haunts of low vice and dissipation, but afterward is reformed and elevated by the power of love.

Clinker, Humphrey.—A novel by Smollett. The hero, by the same name, a philosophic youth, meets many adventures. Brought up in the workhouse, put out by the parish as apprentice to a blacksmith, he was afterward employed as a hostler's assistant. Having been dismissed from the stable, and reduced to great want, he at length attracts the notice of Mr. Bramble who takes him into his family as a servant. He becomes the accepted lover of Winifred Jenkins, and at length turns out to be a natural son of Mr. Bramble.

Cloten (*klō'ten*).—A rejected lover of Imogen, in Shakespeare's play of *Cymbeline.*

Clorinda (*klō-rin'dä*).—*Jerusalem Delivered*, Tasso. Clorinda, the heroine of this poem, is represented as an Amazon inspiring the most tender affection in others, especially in the Christian chief Tancred; yet she is herself susceptible of no passion but the love of military fame.

Clouds, The.—A famous comedy by Aristophanes. Strepsiades ("Turncoat") sends his spendthrift son Phidippides to the phrontistery ("thinking shop") of Socrates, who appears as a sophist, to be reformed by training in rhetoric. Phidippides refuses to go; so Strepsiades goes himself, and finds Socrates swinging in a basket, observing the sun and ether. Socrates summons the Clouds, his new deities, and undertakes to make a sophist of him and free him from the religion of his fathers. Unfortunate results of his new knowledge show Strepsiades his error, and he abandons Socrates and sets the phrontistery on fire.

Cock, The.—A famous tavern in Fleet street, London, opposite the Temple. Tennyson has immortalized it in his *Will Waterproof's Lyrical Monologue.*

Cœlebs (*sē'lebz*).—The hero of a novel by Hannah More, *Cœlebs in Search of a Wife.*

Colada. (*kō-lä'тнä*).—The sword taken by the Cid from Ramon Berenger, count of Barcelona. This sword had two hilts of solid gold.

Colin Clout (*kol'in klout*).—A name that Spenser applies to himself in the *Faërie Queene* and *Shepherd's Calendar.* Colin Clout also is introduced into Gay's pastorals.

Cologne (*kō-lōn'*), **The Three Kings of.**—The three magi who visited the Infant Savior, and whose bodies are said to have been brought by the Empress Helena from the East to Constantinople, whence they were transferred to Milan. Afterward they were removed to Cologne and placed in the principal church of the city. Their names are commonly said to be Jaspar, Melchior, and Balthazar.

Comedy of Errors.—A comedy by Shakespeare. Twin brothers of exact likeness named Antipholus are served by attendant slaves named Dromio also of striking resemblance. The humor of the play lies in the complications that arise. The two brothers are lost at sea with their servants and are picked up by different vessels. After long separation they all reappear in Ephesus. There is great entanglement of plot until both brothers face each other in a trial before the duke and all is explained.

Complete Angler, The (or, *The Contemplative Man's Recreation.* "A discourse, of Fish and Fishing, not unworthy the Perusal of most Anglers").—A famous treatise by Izaak Walton, published in 1653. "Whether," says Sir John Hawkins, "we consider the elegant simplicity of the style, the ease and unaffected humor of the dialogue, the lovely scenes which it delineates, the enchanting pastoral poetry which it contains, or the fine morality it so sweetly inculcates, it has hardly its fellow in any of the modern languages."

Comus.—A masque, or dramatic poem, by John Milton, published in 1637. It was written for the earl of Bridgewater, and acted at his residence, Castle Ludlow, in Shropshire, on Michaelmas night, 1634. The music is by Henry Lawes. Comus (a revel) was the Roman god of banqueting and festive amusements; but in Milton's poems he appears as a lewd enchanter, whose pleasure it is to deceive and ruin the chaste and innocent.

Coningsby (*kon'ingz-bi*).—A novel by B. Disraeli. The characters are meant for portraits: thus, "Rigby" represents Croker; "Monmouth," Lord Hertford; "Eskdale," Lowther; "Ormsby," Irving; "Lucretia," Mme. Zichy; "Countess Colonna," Lady Strachan; "Sidonia," Baron A. de Rothschild; "Henry Sidney," Lord John Manners; "Belvoir," duke of Rutland, second son of Beaumanoir.

Consuelo (*kôn-sū-ā-lō'*).—A noted novel by George Sand. The heroine has the same name, and is an impersonation of noble purity sustained amidst great temptations.

Cophetua (*kō-fet'ū-ä*).—An imaginary African king, of whom a legendary ballad told that he fell in love with a beggar maid and married her. This ballad is found in Percy's *Reliques.* Tennyson has given us a modern version in *The Beggar Maid.*

Copperfield, David.—A novel by Charles Dickens. David is Dickens himself, and Micawber is Dicken's father. According to the tale, David's mother was nursery governess in a family where Mr. Copperfield visited. At the death of Mr. Copperfield, the widow married Edward Murdstone, a hard, tyrannical man, who made the home of David a dread and terror to the boy. When his mother died, Murdstone sent David to lodge with the Micawbers, and bound him apprentice to Messrs. Murdstone and Grinby, by whom he was put into the warehouse, and set to paste labels upon wine and spirit bottles. David soon became tired of this dreary work, and ran away to Dover, where he was kindly received by his [great-]aunt Betsy Trotwood, who clothed him, and sent him as day-boy to Dr. Strong, but placed him to board with Mr. Wickfield, a lawyer, father of Agnes, between whom and David a mutual attachment sprang up. David's first wife was Dora Spenlow, but at the death of this pretty little "child-wife," he married Agnes Wickfield.

Cordelia (*kôr-dē'liä*).—*King Lear*, Shakespeare. The youngest of Lear's three daughters, and the one that truly loved him.

Corinne (*ko-rēn'*).—The heroine of a novel, of the same name, by Madame de Staël.

Coriolanus (*kō'ri-ō-lā'nus.*)—An historical play by William Shakespeare. In the plot, and in many of the speeches, Shakespeare has followed Sir Thomas North's *Life of Coriolanus*, included in his translation of Amyot's *Plutarch.* "The subject of *Coriolanus*,"

says Prof. Dowden, "is the ruin of a noble life through the sin of pride. If duty be the dominant ideal with Brutus, and pleasure of a magnificent kind be the ideal of Antony and Cleopatra, that which gives tone and color to Coriolanus is an ideal of self-centered power. The greatness of Brutus is altogether that of the moral conscience; his external figure does not dilate upon the world through a golden haze like that of Antony, nor bulk massively and tower like that of Coriolanus. A haughty and passionate personal feeling, a superb egoism, are with Coriolanus the sources of weakness and of strength."

Corsair, The.—A poem, in three cantos, by Lord Byron, published in 1814. The hero is called Conrad, and is described, in a well-known passage, as leaving

"a Corsair's name to other times,
Link'd with one virtue, and a thousand crimes."

The heroines are Medora, whom Conrad loves, and Gulnare, "the Harem queen," whose love is given to Conrad, and who kills her master, Seyd, in order that Conrad may be free.

Corydon (*kor'i-don*).—A shepherd in one of the *Idylls of Theocritus*, and one of the *Eclogues* of Vergil. Used by Shakespeare and later poets to designate a rustic swain.

Costard (*kos'tärd*).—A clown, in Shakespeare's *Love's Labor's Lost*, who apes the display of wit, and misapplies, in the most ridiculous manner, the phrases and modes of combination in argument that were then in vogue.

Cotter's Saturday Night, The.—A poem by Robert Burns of which his brother remarks: "Robert had frequently remarked to me that there was something particularly venerable in the phrase, 'Let us worship God,' used by a decent, sober head of a family introducing family worship. To this sentiment of the author the world is indebted for the *Cotter's Saturday Night*. The hint of the plan and title of the poem are taken from Ferguson's *Farmer's Ingle*."

Count of Monte Cristo.—A celebrated romance by Alexander Dumas, in which Edmond Dantes, the hero, suffers unjust imprisonment for many years. He finally escapes, only to be apprised of the death of his father and the marriage of his former sweetheart. From information derived from a fellow prisoner, he then comes into possession of great riches through the successful discovery of hoards of treasure in the island of Monte Cristo. His remaining years are given over to a vindication of his former life.

Coverly (papers by Steele and Addison), **Sir Roger de,** was a member of a hypothetical club, and was noted for his modesty, generosity, hospitality, and eccentric whims. He was most courteous to his neighbors, most affectionate to his family, most amiable to his domestics. Sir Roger, who figures in thirty papers of the *Spectator*, is the very beau-ideal of an amiable country gentleman of Queen Anne's time.

Crabtree.—A character in Smollett's novel, *The Adventures of Peregrine Pickle*.

Crane, Ichabod.—The name of a Yankee schoolmaster, whose adventures are related in the *Legend of Sleepy Hollow*, in Irving's *Sketch-Book*.

Crawley (*krâ'li*), **Rawdon.**—The husband of Becky Sharp in *Vanity Fair*, Thackeray's novel without a hero.

Creakle (*krē'kl*), **Mr.**—A tyrannical and cruel schoolmaster in Dickens' *David Copperfield*.

Cressida (*kres'i-dä*).—The heroine of Shakespeare's play, *Troilus and Cressida*, also the heroine of one of Chaucer's *Canterbury Tales*.

Croaker.—A character in Goldsmith's comedy, *The Good-Natured Man*.

Crummles (*krum'lz*), **Vincent.**—A theatrical head of a theatrical family in Dickens' *Nicholas Nickleby*.

Crusoe, Robinson.—Title and hero of a novel by Daniel Defoe. Robinson Crusoe is a shipwrecked sailor, who leads a solitary life for many years on a desert island, and relieves the tedium of life by ingenious contrivances (1719). The story is based on the adventures of Alexander Selkirk, a Scotch sailor, who in 1704 was left by Captain Stradding on the uninhabited island of Juan Fernandez. Here he remained for four years and four months, when he was rescued by Captain Woodes Rogers and brought to England.

Cuttle, Captain.—A character in Dickens' *Dombey and Son*, good-humored, eccentric, pathetic in his simple credulity.

Cymbeline (*sim'be-lin*).—Title and hero of Shakespeare's play. Imogen, daughter of Cymbeline, king of Britain, married clandestinely Posthumus Leonatus; and Posthumus, being banished for the offense, retired to Rome. One day, in the house of Philario, the conversation turned on the merits of wives, and Posthumus bet his diamond ring that nothing could tempt the fidelity of Imogen. Through the villainy of Iachimo, Cymbeline was forced to believe Imogen untrue. The villainy was in time disclosed, and the beautiful character of Imogen revealed.

D

Dalgetty (*dal'get-i*), **Captain Dugald.**—A soldier of fortune in Sir Walter Scott's *Legend of Montrose*, distinguished for his pedantry, conceit, valor, vulgar assurance, knowledge of the world, greediness, and a hundred other qualities, making him one of the most amusing, admirable, and natural characters ever drawn by the hand of genius.

Damocles (*dam'ō-klēz*).—A flatterer in the court of Dionysius of Syracuse. By way of answer to his constant praises of the happiness of kings, Dionysius seated him at a royal banquet, with a sword hung over his head by a single horsehair. In the midst of his magnificent banquet, Damocles, chancing to look upward, saw a sharp and naked sword suspended over his head. A sight so alarming instantly changed his views on the felicity of kings. The phrase signifies now evil foreboding or dread, a tantalizing torment.

Damon and Pythias (*pith'i-as*).—(1) A play by Richard Edwards, printed in 1571. Its main subject is tragic, but it calls itself a comedy. (2) A tragedy by John Banim and Richard Lalor Sheil, produced in 1821. (3) Two noble Pythagoreans of Syracuse, who have been remembered as models of faithful friendship. Pythias having been condemned to death by Dionysius, the tyrant of Syracuse, begged to be allowed to go home, for the purpose of arranging his affairs, Damon pledging his own life for the reappearance of his friend. Dionysius consented, and Pythias returned just in time to save Damon from death. Struck by so noble an example of mutual affection, the tyrant pardoned Pythias, and desired to be admitted into their sacred fellowship.

Dandie Dinmont.—A jovial, true-hearted store-farmer, in Sir Walter Scott's *Guy Mannering*.

Daphnis (*daf'nis*) **and Chloe** (*klō'ē*).—A prose-pastoral love story in Greek, by Longus, a Byzantine. Gessner has imitated the Greek romance in his idyll called *Daphnis*. In this love story Longus says he was hunting in Lesbos, and saw in a grove consecrated to the nymphs a beautiful picture of children exposed, lovers plighting their faith, and the incursions of pirates, which he now expresses and dedicates to Pan, Cupid and the nymphs. Daphnis, of course, is the lover of Chloe.

Darby and Joan.—This ballad is frequently called *The Happy Old Couple*. The words are sometimes attributed to Prior. Darby and Joan are an old-fashioned, loving couple, who are wholly averse to change of any sort. It is generally said that Henry Woodfall was the author of the ballad, and that the originals were John Darby (printer, of Bartholomew Close, who died 1730) and his wife Joan. Woodfall served his apprenticeship with John Darby.

Dares (*dā'rēz*).—One of the competitors at the funeral games of Anchises in Sicily, described in the fifth book of Vergil's *Æneid*.

David.—(1) He was the uncle of King Arthur. St. David first embraced the ascetic life in the Isle of Wight, but subsequently removed to Menevia, in Pembrokeshire, where he founded twelve convents. (2) One of the Israelite kings. (3) In Dryden's satire called *Absalom and Achitophel*, represents Charles II.; Absalom, his beautiful but rebellious son, represents the duke of Monmouth.

Davy.—*Henry IV.*, Shakespeare. The varlet of Justice Shallow, who so identifies himself with his master that he considers himself half host, half varlet. Thus when he seats Bardolph and Page at table, he tells them they must take "his" good will for their assurance of welcome.

Dawfyd.—*The Betrothed*, Scott. The one-eyed freebooter chief.

Dawkins (*dä'kinz*).—*Oliver Twist*, Dickens. Known by the sobriquet of the *Artful Dodger*. He is one of Fagin's tools. Jack Dawkins is a scamp, but of a cheery, buoyant temper.

Dayonet, Sir.—In the romance *Le Mort d'Arthur* he is called the fool of King Arthur.

Deans, Douce Davie.—A poor herdsman at Edinburgh, and the father of Effie and Jeanie Deans, in Sir Walter Scott's novel, *The Heart of Midlothian*.

Deans, Effie.—A beautiful but unfortunate character in Sir Walter Scott's *Heart of Midlothian*.

Deans, Jeanie.—The heroine of Sir Walter Scott's *Heart of Midlothian*, described as a perfect model of sober heroism, of the union of good sense and strong affections, firm principles, and perfect disinterestedness and of calm superiority to misfortune, danger, and difficulty which such a union must create.

Decameron (*de-kam'e-ron*), **The.**—A collection of romances by Giovanni Boccaccio. It derives its name from its framework. Seven gentlemen and three ladies retire from Florence, during the plague, to a pleasant garden retreat, where they beguile the time by narrating various stories of love adventure.

Dedlock, Lady.—Wife of Sir Leicester, beautiful, and apparently cold and heartless, but suffering constant remorse. The daughter's name is Esther Summerson, the heroine of the novel.

Dedlock, Sir Leicester.—A character in *Bleak House*, by Charles Dickens. An honorable and truthful man, but of such fixed ideas that no man could shake his prejudices. He had an idea that the one thing of greatest importance to the world was a certain family by the name of Dedlock. He loved his wife, Lady Dedlock, and believed in her implicitly. His pride had a terrible fall when he learned the secret of her life before her marriage and knew the terrible fact she had been hiding from him that she had a daughter.

Deerslayer, The.—The title of a novel by J. F. Cooper, and the nickname of its hero, Natty, or Nathaniel Bumppo. He is a model uncivilized man, honorable, truthful, and brave, pure of heart and without reproach. He is introduced in five of Cooper's novels: *The Deerslayer*, *The Pathfinder*, *The Last of the Mohicans*, *The Pioneers*, and *The Prairie*. He is called "Hawk-Eye" in *The Last of the Mohicans;* "Leather-Stocking" in *The Pioneers;* and "The Trapper" in *The Prairie*, in which last book he dies.

Defarge (*da-färzh'*), **Mme.**—Wife of the following, a dangerous woman, everlastingly knitting.

Defarge, Mons.—*Tale of Two Cities*, Dickens. Keeper of a wine shop in the Faubourge St. Antoine in Paris. He is a bull-necked, implacable-looking man.

Della Crusca Accademia (*del'lä krös'kä äk-kä-dä'mē-ä*).—Applied in England to a brotherhood of poets, at the close of the eighteenth century, under the leadership of Mrs. Piozzi. This school was conspicuous for affectation and high-flown panegyrisc on each other. It was stamped out by Gifford, in *The Baviad*, in 1794, and *The Mœviad*, in 1796. Robert Merry, who signed himself *Della Crusca*, James Cobb, a farce-writer, James Boswell, biographer of Dr. Johnson, O'Keefe, Morton, Reynolds, Holcroft, Sheridan, Colman the Younger, Mrs. H. Cowley, and Mrs. Robinson were its best exponents.

Delphin Classics.—For the use of the dauphin, son of Louis XIV. the writings of thirty-nine Latin authors were collected and published in sixty volumes. Notes and an index were added to each work. An edition of the *Delphin Classics* was published in London in the year 1818.

Delphine, Madame.—*Old Creole Days*, George W. Cable. A free quadroon connected with the splendor of Lafitte, the smuggler and patriot. Madame Delphine disowned her beautiful daughter Olive in order to assure to her the rights of a white woman.

Demetrius (*de-mē'tri-us*).—*Midsummer Night's Dream*, Shakespeare. The young Athenian to whom Egeno promised his daughter Hermia in marriage.

Dempster, Janet.—A character from George Eliot's *Scenes From Clerical Life*. She was a woman of generous impulse, succumbed to drink through the brutality of her husband, but was restored by a clergyman to a life of nobility.

De Profundus.—*Out of the Depths*. The one hundred and thirtieth Psalm is so called from the first two words in the Latin version. In the Catholic liturgy it is sung when the dead are committed to the grave.

Deronda, Daniel.—One of George Eliot's strongest character sketches in her novel of the same name.

Deserted Village, The.—A poem by Oliver Goldsmith. It was "instantaneously popular. Two new editions of it were called for in the following month, and a fourth in August, and passages from the poem were in every mouth, and the topics which it suggested, of depopulation, luxury, and landlordism, were discussed in connection with it."

The Deserted Village has been identified with Lissoy, a quaint Irish village in the parish of Kilkenny West, of which Goldsmith's father was the pastor, and whose natural features are accurately described in the poem.

Desmas.—The repentant thief is so called in *The Story of Joseph of Arimathea*. Longfellow, in *The Golden Legend*, calls him Dumachus. The impenitent thief is called Gestas, but Longfellow calls him Titus.

Dhu, Roderick.—A highland chieftain and outlaw in Scott's poem *Lady of the Lake*, cousin of Ellen Douglas, and also her suitor. He is slain by James Fitz-James.

Diana.—In Shakespeare's *All's Well That Ends Well*, daughter of the widow of Florence with whom Helena lodged on her way to the shrine of St. Jacques le Grand. Count Bertram wantonly loved Diana, but she brought about a reconciliation between Bertram and his wife Helena.

Diggon (*dig'on*), **Davie.**—A shepherd in the *Shepherd's Calendar*, by Spenser. He drove his sheep into foreign lands, hoping to find better pasture; but was amazed at the luxury and profligacy of the shepherds whom he saw there.

Diggory (*dig'ō-ri*).—In Goldsmith's *She Stoops to Conquer*, a barn laborer, employed on state occasions for butler and footman by Mr. and Mrs. Hardcastle. He is both awkward and familiar, laughs at his master's jokes and talks to his master's guests while serving.

Dimmesdale (*dimz'dāl*), **Arthur.**—In Hawthorne's romance, *The Scarlet Letter*, a Puritan minister of great eloquence, whose conscience compels him to make a public confession of sin.

Dinah.—(1) *St. Ronan's Well*, Scott, Daughter of Sandie Lawson, landlord of the Spa hotel. (2) A character in Mrs. Stowe's *Uncle Tom's Cabin*.

Dinah, Aunt.—In Sterne's *Tristram Shandy*. She leaves Mr. Walter Shandy one thousand pounds, which he fancies will enable him to carry out all the schemes that enter into his head.

Dinah Friendly.—*The Bashful Man*, Moncrieff. Daughter of Sir Thomas Friendly.

Dingley Hall.—*Pickwick Papers*, Dickens. The home of Mr. Wardle and his family.

Divina Commedia (*dē-vē'nä kom-mä'dē-ä*), (or, *Divine Comedy*).—The first poem of note ever written in the Italian language. It is an epic by Dante Alighieri, and is divided into three parts: Hell, Purgatory, and Paradise. Dante called it a *comedy*, because the ending is happy; and his countrymen added the word *divine* from admiration of the poem. The poet depicts a vision, in which he is conducted, first by Vergil (*human reason*) through hell and purgatory; and then by Beatrice (*revelation*), and finally by St. Bernard through the several heavens, where he beholds the Triune God.

"Hell" is represented as a funnel-shaped hollow, formed of gradually contracting circles, the lowest and smallest of which is the earth's center. "Purgatory" is a mountain rising solitary from the ocean on that side of the earth which is opposite to us. It is divided into terraces, and its top is the terrestrial paradise. From this "top" the poet ascends through the seven planetary heavens, the fixed stars, and the "primum mobile."

In all parts of the regions thus traversed there arise conversations with noted personages. The deepest questions of philosophy and theology are discussed and solved; and the social and moral condition of Italy, with the corruptions of church and state, are depicted with indignation. Fifty-two years after the poet's death the republic of Florence set apart an annual sum for public lectures to explain the *Divine Comedy* to the people in one of the churches, and Boccaccio himself was appointed first lecturer.

Doctor Syntax.—The hero of a work entitled *The Tour of Dr. Syntax in Search of the Picturesque*. Doctor Syntax is a simple-minded, pious, hen-pecked clergyman, but of excellent taste and scholarship, who left home in search of the picturesque. His adventures are told in eight-syllable verse by William Combe.

Dods.—The old landlady in Scott's novel called *St. Ronan's Well*. An excellent character, a mosaic of oddities, all fitting together and forming an admirable whole. She was so good a housewife that a cookery book of great repute bears her name.

Dodson and Fogg.—The lawyers employed by the plaintiff in the famous case of "Bardell *vs.* Pickwick," in the *Pickwick Papers*, by Charles Dickens.

Doeg (*dō'eg*).—*Absalom and Achitophel*, Dryden. Doeg was Saul's herdsman, who had charge of his mules and asses. He told Saul that the priests of Nob had provided David with food; whereupon Saul sent him to put them to death, and eighty-five were ruthlessly massacred.

Dogberry (*dog'ber-i*) **and Verges** (*ver'gēz*).—Two ignorant conceited constables, in Shakespeare's *Much Ado About Nothing*.

Dolla Murrey.—A character in Crabbe's *Borough* who was devoted to playing cards. She died at the card table.

Dolly Varden (*vär'den*).—*Barnaby Rudge*, Dickens. Daughter of Gabriel Varden, locksmith. Dolly dressed in the Watteau style, and was lively, pretty, and bewitching.

Dombey and Son.—A novel by Dickens. Mr. Dombey is a self-sufficient, purse-proud, frigid merchant who feels satisfied there is but one Dombey in the world, and that is himself. When Paul was born, his ambition was attained, his whole heart was in the boy, and the loss of the mother was but a small matter. The boy's death turned his heart to stone.

Dombey, Florence.—A motherless child, hungering and thirsting to be loved, but regarded with indifference by her father, who thinks that sons alone are worthy of regard.

Domesday Book (or, *Doomsday Book*).—The name of one of the oldest and most valuable records of England, containing the results of a statistical survey of that country made by William the Conqueror, and completed in the year 1086. The origin of the name—which seems to have been given to other records of the same kind—is somewhat uncertain; but it has obvious reference to the supreme authority of the book in doom or judgment on the matters contained in it.

Dominie Sampson.—*Guy Mannering*, Scott. A village schoolmaster and scholar, poor as a church mouse, and modest as a girl. He cites Latin like a *porcus literarum* and exclaims "prodigious!" He is no uncommon personage in a country where a certain portion of learning is easily attained by those who are willing to suffer hunger and thirst in exchange for acquiring Greek and Latin.

Don Adriano de Armado.—A pompous, fantastical Spaniard in Shakespeare's *Love's Labor's Lost*, who had a mint of phrases in his brain.

Donatello (*don-ä-tel'lō*).—The hero of Hawthorne's romance *The Marble Faun*. He is a young Italian with a singular likeness to the Faun of Praxiteles. He leads an innocent but purely animal existence, until a sudden crime awakens his conscience and transforms his whole nature.

Don Cherubim.—The *Bachelor of Salamanca*, in Le Sage's novel of this name; a man placed in different situations of life, and made to associate with all classes of society, in order to give the author the greatest possible scope for satire.

Donegild.—*Man of Law's Tale*, Chaucer. The mother of Alla, king of Northumberland, hating Constance, the wife of Alla, because she was a Christian, she put her on a raft with her infant son and turned her adrift. When Alla returned from Scotland and discovered this cruelty of his mother, he put her to death. The tradition of St. Mungo resembles the *Man of Law's Tale* in many respects.

Don Juan (*don jū'an;* Sp. pron. *dōn* HŌ-*ăn'*).—Typifies in literature a profligate. He gives himself up so entirely to the gratification of sense, especially to the most powerful of all the impulses, that of love, that he acknowledges no higher consideration, and proceeds to murder the man that stands between him and his wish, fancying that in so doing he had annihilated his very existence. He then defies that Spirit to prove to his senses his existence. The Spirit returns and compels Don Juan to acknowledge the supremacy of spirit, and the worthlessness of a merely sensuous existence. The traditions concerning Don Juan have been dramatized by Tirso de Molina. Glück has a musical ballet, *Don Juan*, and Mozart has immortalized the character in his opera *Don Giovanni;* and Byron in a half-finished poem.

Don Quixote (*dōn kē-hō'tā*).—A celebrated Spanish romance by Cervantes. Don Quixote is represented as "a gaunt country gentleman of La Mancha, full of genuine Castilian honor and enthusiasm, gentle and dignified in his character, trusted by his friends, and loved by his dependents," but "so completely crazed by long reading the most famous books of chivalry that he believes them to be true, and feels himself called on to become the impossible knight-errant they describe, and actually goes forth into the world to defend the oppressed and avenge the injured, like the heroes of his romances." The fame of Cervantes will always rest upon this incomparable satire.

Dorrit.—See *Little Dorrit*.

Doorm.—*Idylls of the King* (*Enid*), Tennyson. An earl called "the Bull," who tried to make Enid his handmaid; but, when she would neither eat, drink, nor array herself in bravery at his bidding, "he smote her on the cheek"; whereupon Geraint slew the "russet-bearded earl" in his own hall.

Dora.—*David Copperfield*, Dickens. The child-wife to David, affectionate and tender-hearted. She was always playing with her poodle and saying simple things to her "Dody." She could never be his helper, but she looked on her husband with idolatrous love. When quite young she died.

Dorastus.—The hero of an old popular "history" or romance, upon which Shakespeare founded his *Winter's Tale*. It was written by Robert Greene, and was first published in 1588, under the title of *Pandosto, the Triumph of Time*.

Dorothea.—The heroine of Goethe's celebrated poem of *Herman und Dorothea*.

Dory, John.—A character in *Wild Oats* or *The Strolling Gentleman*, a comedy by John O'Keefe.

Dotheboys Hall (*dō'the-boiz hăl*). —*Nicholas Nickleby*, Dickens. A school for boys kept by a Mr. Squeers, a puffing, ignorant, overbearing brute, whose system of education consisted of alternately beating and starving.

Doubting Castle.—The castle of the giant Despair, in which Christian and Hopeful were incarcerated, but from which they escaped by means of the key called "Promise," which was able to open any lock in the castle.

Dousterswivel (*dōs'ter-swiv-el*), **Herman.**—Scott, *The Antiquary*. A German schemer, who obtains money under the promise of finding hidden wealth by a divining rod.

Drawcansir (*drâ'kan-ser*).—A bragging, blustering bully, in George Villiers, duke of Buckingham's *The Rehearsal*, who took part in a battle, and killed everyone on both sides, "sparing neither friend nor foe."

Driver.—*Guy Mannering*, Scott. Clerk to Mr. Pleydell, advocate, Edinburgh.

Dromio.—*The Brothers Dromio*. Twin brothers exactly alike, who serve two brothers exactly alike, in Shakespeare's *Comedy of Errors*, based on the *Menæchmi* of Plautus.

Dry-as-dust, The Rev.—An imaginary personage who serves to introduce Scott's novels to the public.

Dudu.—One of the three beauties of the harem, into which Juan, by the sultana's order, had been admitted in female attire.

Duessa (*dū-es'sa*).—A foul witch, in Spenser's *Faërie Queene*, who under the assumed name of Fidessa, and the assumed character of a distressed and lovely woman, entices the Red-cross Knight into the House of Pride.

Duff, Jamie.—*Guy Mannering*, Scott. The idiot boy attending Mrs. Bertram's funeral.

Dulcinea del Toboso (*dul-sin'ē-ä del tō-bō'zō*).—A country girl whom Don Quixote courts as his lady love.

Dumain (*dū-mān'*).—A lord attending on the king of Navarre in Shakespeare's *Love's Labor's Lost*.

Duncan.—(1) A king of Scotland immortalized in Shakespeare's tragedy of *Macbeth*. Shakespeare represents him as murdered by Macbeth, who succeeds to the Scottish throne, but according to history he fell in battle. (2) A highland hero in Scott's *Lady of the Lake*.

Dunder, Sir David, of Dunder Hall.—A conceited, whimsical old gentleman, who forever interrupts a speaker with "Yes, yes, I know it," or "Be quiet, I know it." *Ways and Means*, by Colman.

Dundreary (*dun-drēr'i*), **Lord.**—A grotesque character in Taylor's comedy, *Our American Cousin*, noted for his aristocratic haughtiness of manner. The character is said to have been created by the actor Sothern.

Durandana (*dō-rän-dä'nä*).—The name of the marvelous sword of Orlando, the renowned hero of romance, said to have been wrought by the fairies, who endued it with such power that its owner was able to cleave the Pyrenees with it at a blow.

Durandarte (*dō-rän-där'te*).—A fabulous hero of Spain. Cervantes has introduced him, in *Don Quixote*, in the celebrated adventure of the knight in the cave of Montesinos.

Durden (*der'den*), **Dame.**—(1) The heroine of a popular English song. She is described as a notable housewife, and the mistress of five serving-girls and five laboring men. The five men loved the five maids. (2) A sobriquet playfully applied to Esther Summerson, the heroine of Dickens' *Bleak House*.

Durward (*der'wärd*), **Quentin.**—A novel by Scott. Quentin Durward is a young archer of the Scottish guard in the service of Louis XI. of France. When Liège is assaulted, Quentin Durward and the Countess Isabelle, who has been put into his charge, escape on horseback. The countess publicly refuses to marry the Duc d'Orléans, to whom she has been promised, and ultimately marries the young Scotchman.

Dwarf, Alberich.—In the *Nibelungen Lied* the dwarf "Alberich" is the guardian of the famous hoard won by Siegfried from the Nibelungs. The dwarf is twice vanquished by the hero, who gets possession of his "Tarn-Kappe" (cloak of invisibility).

Dwarf, The Black.—A novel by Sir Walter Scott. The dwarf is a fairy of the most malignant character; a genuine northern Duergar, and once held by the dalesmen of the border as the author of all the mischief that befell their flocks and herds. In Scott's novel the black dwarf is introduced under the aliases of Sir Edward Mauley; Elshander, the recluse; Cannie Elshie; and the Wise Wight of Mucklestane Moor.

E

Ecce Homo (*ek'sē hō'mō*).—The title of a semi-theological work, attributed to Professor Seeley, and published in 1865, in which the humanity of Christ is considered and enforced, apart from his divinity. The phrase, "The enthusiasm of humanity," was

originated in this work; to which, it may be mentioned, Dr. Joseph Parker replied in his *Ecce Deus* published in 1866.

Eckhardt, The Faithful.—A legendary hero of Germany, represented as an old man with a white staff, who, in Eisleben, appears on the evening of Maundy Thursday, and drives all the people into their houses, to save them from being harmed by a terrible procession of dead men, headless bodies, and two-legged horses, which immediately after passes by. Other traditions represent him as the companion of the knight Tannhäuser, and as warning travelers from the Venusberg, the mountain of fatal delights in the old mythology of Germany. Tieck has founded a story upon this legend, which has been translated into English by Carlyle, in which Eckhardt is described as the good servant who perishes to save his master's children from the seducing fiends of the mountain. The German proverb, "Thou art the faithful Eckhardt; thou warnest everyone," is founded upon this tradition.

Eclecta.—The "Elect" personified in *The Purple Island*, by Phineas Fletcher. She is the daughter of Intellect and Voletta (free-will).

Ector, Sir.—The foster-father of King Arthur, and lord of many parts of England and Wales. Father of Sir Kay, seneschal to King Arthur.

Edenhall, The Luck of.—A painted goblet in the possession of the Musgrave family of Edenhall, Cumberland, said to have been left by the fairies on St. Cuthbert's Well. The tradition runs that the luck of the family is dependent on the safe-keeping of this goblet. The German poet Uhland embodied the legend in a ballad, translated into English by Longfellow.

Edgar.—Son to Gloucester, in Shakespeare's tragedy of *Lear*. He was disinherited for his half-brother Edmund.

Edgar, or **Edgardo.**—Master of Ravenswood, in love with Lucy Ashton in Scott's *Bride of Lammermoor*.

Edith.—The *Maid of Lorn* in Scott's *Lord of the Isles*, who married Ronald when peace was restored after the battle of Bannockburn.

Edith, The Lady.—*Ivanhoe*, Scott. Mother of Athelstane "the Unready" (thane of Coningsburgh).

Edith Granger.—Daughter of the Hon. Mrs. Skewton, married to Colonel Granger of Ours, who died within two years. Edith became Mr. Dombey's second wife, but the marriage was altogether unhappy.

Edith Plantagenet (*plan-taj'e-net*), **The Lady.**—*The Talisman*, Scott. Called "The Fair Maid of Anjou," a kinswoman of Richard I., and attendant on Queen Berengaria.

Edmund.—A bastard son of Gloucester in Shakespeare's tragedy of *King Lear*.

Edward, Sir.—*The Iron Chest*, Colman. He commits a murder, and keeps a narrative of the transaction in an iron chest. Later, he trusts the secret to his secretary, Wilfred, and the whole transaction now becomes public.

Edward.—*Count Robert of Paris*, Scott. Brother of Hereward, the Varangian guard. He was slain in battle.

Edwin.—(1) The hero of Goldsmith's ballad entitled *The Hermit*. (2) The hero of Mallet's ballad *Edwin and Emma*. (3) The hero of Beattie's *Minstrel*.

Edyrn.—*Idylls of the King* (*Enid*), Tennyson. Son of Nudd. A suitor for the hand of Enid and an evil genius of her father, who opposed him. Later, Edyrn went to the court of King Arthur and became quite a changed man—from a malicious "sparrow-hawk" he was converted into a courteous gentleman.

Egeus (*ē-jē'us*).—Father of Hermia in Shakespeare's *Midsummer Night's Dream*.

Eglamour.—A character, in Shakespeare's *Two Gentlemen of Verona*, who is an agent of Silvia in her escape.

Eglamour (*eg'la-mŏr*), **Sir.**—A valiant knight of the Round Table, celebrated in the romances of chivalry, and in an old ballad.

Eglantine (*eg'lan-tīn*), **Madame.**—The prioress in Chaucer's *Canterbury Tales*, who was "full pleasant and amiable of port." She was distinguished for the lady-like delicacy of her manners at table, and for her partiality to "small hounds," and a peculiar mixture in her manner and dress of feminine vanity and slight worldliness, together with an ignorance of the world.

Egyptian Thief.—A personage alluded to by the Duke in Shakespeare's *Twelfth Night*. The reference is to the story of Thyamis, a robber-chief and native of Memphis.

Elvir.—*Harold the Dauntless*, Scott. A Danish maid, who assumes boy's clothing, and waits on Harold "the Dauntless," as his page.

Elaine.—A mythical lady in the romances of King Arthur's court. She is called "the lily maid of Astolat" in Tennyson's *Idylls of the King*. She died for love of Sir Launcelot, and then at her request was borne on a barge to the castle of King Arthur, holding a lily in one hand, and a letter to Launcelot in the other.

Elbow.—A constable, in Shakespeare's *Measure for Measure*, modest and well-meaning, though of simple mind and the object of wit among those who are wiser but not better.

El Dorado.—A name given by the Spaniards to an imaginary country, supposed, in the sixteenth century, to be situated in the interior of South America, and abounding in gold and all manner of precious stones.

Electra.—The daughter of Agamemnon and Clytemnestra, and the heroine of a tragedy by Sophocles and of another by Euripides.

Elegy Written in a Country Churchyard.—By Thomas Gray. Dr. Johnson gives 1750 as the date of publication; and declares that the piece "abounds with images which find a mirror in every mind, and with sentiments to which every bosom returns an echo." The churchyard was that of Stoke Pogis, near Eton.

Elim.—*The Nessiah*, Klopstock. The guardian angel of Libbeus the Apostle. Libbeus, the tenderest and most gentle of the apostles, at the death of Jesus also died from grief.

Elissa.—Step-sister of Medina and Perissa, in Spenser's *Faërie Queene*. They could never agree upon any subject.

Elliott, Hobbie.—There are seven by this name in the *Black Dwarf*, by Sir Walter Scott. The farmer Elliott himself and his bride-elect, Grace Armstrong; Mrs. Elliott, Hobbie's grandmother; John and Harry, Hobbie's brothers; Lilias, Jean, and Arnot, Hobbie's sisters.

Elops.—Milton gives this name to the dumb serpent which gives no warning of its approach.

Elsie.—The daughter of Gottlieb, a farm tenant of Prince Henry of Hohenneck, who offered her life as a substitute for the prince. She was rescued as she was about to make the sacrifice. Longfellow has told this story in *The Golden Legend*.

Elspeth (*el'speth*).—(1) A character in Sir Walter Scott's *Antiquary*. (2) An old servant to Dandie Dinmont in Scott's *Guy Mannering*.

Elvira.—(1) In Cibber's *Love Makes a Man*, sister of Don Duart, and niece of the governor of Lisbon. She marries Clodio, the coxcomb son of Don Antonio. (2) The young wife of Gomez, a rich old banker, in Dryden's *The Spanish Fryer*. She carries on a liaison with Colonel Lorenzo, by the aid of her father-confessor Dominick, but is always checkmated, and it turns out that Lorenzo is her brother.

Emelye.—The sister-in-law of "Duke Theseus," beloved by the two knights, Palamon and Arcyte.

Emile (*ā-mēl'*).—A philosophical romance on education by Jean Jacques Rousseau (1762). Emile, the chief character, is the author's ideal of a young man perfectly educated, every bias but that of nature having been carefully withheld.

Emilia (*ē-mil'i-ä*).—(1) A lady attending Hermione in Shakespeare's *Winter's Tale*. (2) Wife to Iago, and waiting woman to Desdemona, in the tragedy of *Othello*, a woman of thorough vulgarity and loose principles, united to a high degree of spirit, energetic feeling, strong sense, and low cunning. (3) The sweetheart of Peregrine Pickle in Smollett's novel *The Adventures of Peregrine Pickle*.

Em'ly, Little.—*David Copperfield*, Dickens. Daughter of Tom, the brother-in-law of Dan'el Peggotty, a Yarmouth fisherman, by whom the orphan child was brought up. David Copperfield and Em'ly were at one time playfellows. While engaged to Ham Peggotty (Dan'el's nephew) Little Em'ly runs away with Steerforth, a friend of David's, who was a handsome but unprincipled gentleman. Being subsequently reclaimed, she emigrates to Australia with Dan'el Peggotty and old Mrs. Gummidge.

Empyrean.—According to Ptolemy, there are five heavens, the last of which is pure elemental fire and the seat of Deity; this fifth heaven is called the empyrean.

Endell, Martha.—*David Copperfield*, Dickens. A poor girl, to whom Em'ly goes when Steerforth deserts her.

Endymion (*en-dim'i-on*).—A beautiful shepherd boy whom Diana kissed while he lay asleep on Mount Latmus. The story was made the subject of an English poem by Keats, in memory of his much loved friend, the poet Shelley. Shelley pronounced it "full of some of the highest and the finest gleams of poetry."

Also a lyric by Henry Wadsworth Longfellow founded on the old mythic story of the mortal youth who was beloved by Diana, and received her kiss—

When, sleeping in the grove,
He dreamed not of her love.

Enid.—A mythical lady mentioned in a Welsh triad as one of the three celebrated ladies of Arthur's court—a beautiful picture of conjugal patience and affection. Her story is told in the *Mabinogion* and in Tennyson's *Idylls of the King*. In the midst of an impure court she is the personification of purity.

Eolian Harp.—Baruch. There is a rabbinical story of the aërial harmony of the harp of David, which, when hung up at night, was played upon by the north wind.

Epigram.—A short, pointed or antithetical poem; or any short composition happily or antithetically expressed.

Epithalamium (*ep"i-thā-lā'mi-um*).—Was a species of poem which it was the custom among the Greeks and Romans to sing in chorus near the bridal-chamber of a newly married couple. Anacreon, Stesichorus, and Pindar composed poems of this kind, but only scanty fragments have been preserved. Spenser's *Epithalamium*, written on the occasion of his marriage, is one of the finest specimens of this kind of verse.

Eppie.—(1) *St. Ronan's Well*, Scott. One of the servants of the Rev. Josiah Cargill. In the same novel is Eppie Anderson, one of the servants at the Mowbray Arms, Old St. Ronan's, held by Meg Dods. (2) In George Eliot's *Silas Marner* the child of Godfrey Cass, brought up and adopted by Silas Marner, whose love transformed him from a miser into a tender, loving father.

Ermangarde of Baldringham, Lady.—*The Betrothed*, Scott. Aunt of the Lady Eveline Berenger, "the Betrothed."

Ermeline.—The wife of Reynard, in the tale of *Reynard the Fox*.

Ermina.—The heroine of Tasso's *Jerusalem Delivered*, who fell in love with Tancred. When the Christian army besieged Jerusalem, she dressed herself in Clorinda's armor to go to Tancred, but, being discovered, fled, and lived awhile with some shepherds on the banks of the Jordan. Meeting with Vafrino, sent as a secret spy by the crusaders, she revealed to him the design against the life of Godfrey, and, returning with him to the Christian camp, found Tancred wounded. She cured his wounds, so that he was able to take part in the last great day of the siege.

Ernest, Duke.—A poetical romance by Henry of Veldig (Waldeck), contemporary with Frederick Barbarossa. It is a mixture of Greek and oriental myths and hero adventures of the crusader.

Error.—*Faërie Queene*, Spenser. A monster who lived in a den in "Wandering Wood," and with whom the Red-cross Knight had his first adventure. She had a brood of one thousand young ones of sundry shapes, and these cubs crept into their mother's mouth when alarmed, as young kangaroos creep into their mother's pouch. The knight was nearly killed by the stench which issued from the foul fiend, but he succeeded in "rafting" her head off, whereupon the brood lapped up the blood, and burst with satiety.

Escalus (*es'ka-lus*).—An ancient and kind hearted lord, in Shakespeare's *Measure for Measure*, whom Vincentio, the duke of Vienna, joins with Angelo as his deputy during a pretended absence on a distant journey.

Escanes (*es'ka-nēz*).—A lord of Tyre, in Shakespeare's *Pericles*.

Esmeralda.—*Notre Dame de Paris*, Victor Hugo. A beautiful gypsy girl, who, with tambourine and goat, dances in the "place" before Notre Dame.

Esmond, Henry.—A cavalier and fine-spirited gentleman in the reign of Queen Anne. Hero of Thackeray's novel by the same name.

Esmond.—A novel by W. M. Thackeray, published in 1852. Its most striking feature is its elaborate imitation of the style and even the manner of thought of the time of Queen Anne's reign, in which its scenes are laid.

Esprit des Lois [*es-prē' dâ lwa* (or, *Spirit of the Laws*)].—A celebrated philosophical work by Montesquieu, published at Geneva in 1748. The author begins somewhat formally with the old division of politics into democracy, aristocracy, and monarchy. He discusses the principles of each, and their bearings on education, on positive law, on social conditions, on military strength (offensive and defensive) on individual liberty, on taxation and finance. Then an abrupt return is made from the effects to the causes of constitutions and polity. The theory of the influence of physical conditions, and especially of climate, on political and social institutions—a theory which is perhaps more than any other identified with the book—received special attention, and a somewhat disproportionate space is given to the question of slavery in this connection. From climate Montesquieu passes to the nature of the soil as in its turn affecting civil polity. He then attacks the subject of manners and customs as distinct from laws of trade and commerce, of the family, of jurisprudence, of religion. The book concludes with an elaborate examination of the feudal system in France.

Essay on Man.—A poem by Alexander Pope, in four epistles: *Of the Nature and State of Man With Respect to the Universe; Of the Nature and State of Man With Respect to Himself as an Individual; Of the Nature and State of Man With Respect to Society;* and *Of the Nature and State of Man With Respect to Happiness*. Its fundamental idea is to the effect that the system of the universe is a "benevolent system, in which every virtue, as well as every passion, has its object and end."

"If," says Professor Ward, "the *Essay on Man* were shivered into fragments, it would not lose its value; for it is precisely its details which constitute its moral as well as literary beauties. Nowhere has Pope so abundantly displayed his incomparable talent of elevating truisms into proverbs, in his mastery over language and poetic form."

Essays (or, *Counsels Civil and Moral*).—By Francis, Lord Bacon. In the dedication to his brother Anthony, the author says he published the *Essays* "because many of them had been stolen abroad in writing," and he desired to give the world a correct version of his work. The word *Essays*, he says, "is late; but the thing is ancient, for Seneca's Epistles to Lucilius, if you mark them well, are but essays, that is, dispersed meditations, though conveyed in the form of epistles." "The transcendent strength of Bacon's mind is visible," says Hallam, "in the whole tenor of these *Essays*, unequaled as they must be, from the very nature of such compositions. They are deeper and more discriminating than any earlier, or almost any later, work, in the English language; full of recondite observations, long matured, and carefully sifted."

Estella.—The heroine of Dickens' novel of *Great Expectations*.

Estotiland, or **Estotilandia.**—An imaginary region in America, near the arctic circle, referred to by Milton as "cold Estotiland," and variously fabled to have been discovered by Frisian fishermen in the fourteenth century, and by a Pole named John Scalve, in 1477.

Etzel (*et'sel*), *i. e.*, **Attila.**—King of the Huns, a monarch ruling over three kingdoms and more than thirty principalities; being a widower, he married Kriemhild, the widow of Siegfried. In the *Nibelungenlied*, where he is introduced, he is made very insignificant.

Eugénie Grandet (*u-zhā-nē' gron-dā'*).—A novel by Balzac, written in 1833, published in 1834. The heroine, Eugenie, is sacrificed to the cold-blooded avariciousness of her father. This is one of Balzac's best novels.

Eulalia (*ū-lā'li-ā*), **St.**—In the calendar of saints there is a virgin martyr called Eulalia. She was martyred by torture February 12, 308. Longfellow calls Evangeline the *Sunshine of St. Eulalia*.

Eulenspiegel (*oi'len-spē-gel*).—The hero of a German tale, which relates the pranks and drolleries of a wandering cottager of Brunswick.

Euphrasy.—*Paradise Lost*, Milton. The herb eyebright, so called because it was once supposed to be efficacious in clearing the organs of sight. Hence, the Archangel Michael purged the eyes of Adam with it, to enable him to see into the distant future.

Evan Dhu M'Combich.—*Waverley*, Scott. The foster-brother of M'Ivor.

Evan Dhu of Lochiel.—*Legend of Montrose*, Scott. A Highland chief in the army of Montrose.

Evangeline.—The title and heroine of a tale in hexameter verse by Longfellow, in two parts. Evangeline was the daughter of Benedict Bellefontaine, the richest farmer of Acadia (now Nova Scotia). At the age of seventeen she was legally betrothed by the notary-public to Gabriel, son of Basil the blacksmith; but next day all the colony was exiled by the order of George II., and their houses, cattle, and lands were confiscated. Gabriel and Evangeline were parted, and now, sustained by the brightness of hope, she wandered from place to place to find her betrothed. Basil had settled in Louisiana; but when Evangeline reached that distant land, Gabriel had gone. She sought him on the prairies, and, again far north, in Michigan, but ever a few days, a few weeks, too late. At length, grown old in this hopeless quest, she came to Philadelphia and became a sister of mercy. The plague broke out; and, as she visited the almshouse in ministration, she saw an old man who had been smitten with the pestilence. It was Gabriel. He tried to whisper her name; but death closed his lips. "All was ended now;" and "Side by side, in nameless graves, the lovers are sleeping."

Evangelist.—In Bunyan's *Pilgrim's Progress*, represents the effectual preacher of the gospel who opens the gate of life to Christian.

Evans, Sir Hugh.—In Shakespeare's *Merry Wives of Windsor*, a Welsh parson and school-teacher, ignorant but pedantic, who has a ludicrous quarrel with Dr. Caius.

Excalibur (*eks-kal'i-bẽr*), or **Excalibar,** or **Escalibor.**—The sword of the mythical King Arthur. Arthur received it from the hands of the Lady of the Lake. It had a scabbard the wearer of which could lose no blood. There seems, however, to have been also another sword called Excalibur in the early part of the story. This was the sword, plunged deep into a stone, which could be drawn forth only by the man who was to be king. After two hundred knights had failed, Arthur drew it out without difficulty.

Excursion, The.—A poem, in blank verse, by William Wordsworth, published in 1814, and forming the second part of a poem in three parts, to be entitled *The Recluse*, which the author had at one time contemplated. It consists of nine books, respectively entitled *The Wanderer, The Solitary, Despondency, Despondency Corrected, The Pastor, The Churchyard Among the Mountains, The Same Subject Continued, The Parsonage, Discourse of the Wanderer*, and *An Evening Visit to the Lake.*

Eyre (*âr*), **Jane.**—A novel by Charlotte Brontë, published in 1847, with a dedication to William Makepeace Thackeray, as "the first social regenerator of the day." The early scenes are laid in the Lowood Institution, which has been identified with a school established by the Rev. W. Carus Wilson, at Cowen's Bridge, near Leeds, and which is described with stern but unpleasing realism. Much of the book was derived from the author's own personal experience.

Ezzelin, Sir.—*Lara*, Byron. The gentleman who recognizes Lara at the table of Lord Otho, and charges him with being Conrad the Corsair. A duel ensues, and Ezzelin is never heard of more. A serf used to say that he saw a huntsman one evening cast a dead body into the river which divided the lands of Otho and Lara, and that there was a star of knighthood on the breast of the corpse.

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Faa, Gabriel.—*Guy Mannering*, Scott. Nephew of Meg Merrilies. One of the huntsmen at Liddesdale.

Fadladeen.—The hypercritical grand chamberlain in Moore's poem *Lalla Rookh.* Fadladeen's criticism upon the several tales which make up the romance are very racy and full of humor; and his crestfallen conceit when he finds out that the poet was the prince in disguise is well conceived.

Faerie Queene (*fā'e-ri kwēn*), **The.**—A poem by Edmund Spenser, published in 1590. This great allegorical epic is divided into six books, of which the first contains the Legend of the Knight of the Red Cross, or Holiness; the second the Legend of Sir Guyon, or Temperance; the third the Legend of Britomartis, or Chastity; the fourth the Legend of Cambal and Telamond, or Friendship; the fifth the Legend of Artegall, or Justice; and the sixth the Legend of Sir Calidore, or Courtesy. There originally existed twelve books, but the last six, excepting two cantos on Mutability, were lost by the poet's servant in crossing from Ireland to England—a circumstance to be deeply regretted by every lover of true poetry. The finest things in Spenser are the character of Una, in the first book, the House of Pride, the Cave of Mammoth, and the Cave of Despair; the account of Memory; the description of Belphœbe; the story of Florimel and the Witch's Son; the gardens of Adonis and the Bower of Bliss; the Mask of Cupid; and Colin Clout's Vision, in the last book.

Fag.—A lying servant to Captain Absolute in Sheridan's *Rivals.*

Fagin.—An old Jew in Dickens' *Oliver Twist*, who employs young persons of both sexes to carry on a systematic trade of robbery.

Fainall, Mr. and Mrs.—Noted characters in Congreve's comedy *The Way of the World.*

Faineant, Le Noir (*The Black Idler*).—In Sir Walter Scott's *Ivanhoe*, a name applied to Richard Cœur de Lion in disguise, by the spectators of a tournament, on account of his indifference during a great part of the action, in which, however, he was finally victorious.

Fair Maid of Perth.—The title of a novel by Sir Walter Scott, and the name of the heroine.

Fair Rosamond.—Prototype of many heroines of fiction, a daughter of Walter de Clifford. According to a popular legend, which has no foundation in fact, Henry II. built a labyrinth or maze to conceal her from Queen Eleanor, who discovered her by means of a silken clew and put her to death. She is commonly, though erroneously, stated to have been the mother of William Longsword and Geoffrey, archbishop of York.

Fairservice, Andrew.—A shrewd Scotch gardener at Osbaldistone Hall in *Roo Roy*, Sir Walter Scott.

Fairy of the Mine.—A malevolent being, supposed to live in mines, busying itself with cutting ore, turning the windlass, etc., and yet effecting nothing.

Faithful.—One of the allegorical personages in Bunyan's *Pilgrim's Progress*, who dies a martyr before completing his journey.

Faithful, Jacob.—The title and hero of a sea tale, by Captain Marryat (1835).

Fakenham Ghost.—A ballad by Robert Bloomfield, author of *The Farmer's Boy.* The ghost was a donkey.

Fakreddin's Valley.—Over the several portals of bronze were these inscriptions: (1) *The Asylum of Pilgrims;* (2) *The Traveler's Refuge;* (3) *The Depository of the Secrets of All the World.*

Falkland.—In Godwin's novel called *Caleb Williams.* He commits murder, and keeps a narrative of the transaction in an iron chest. Williams, a lad in his employ, opens the chest, and is caught in the act by Falkland. The lad runs away, but is hunted down. This tale, dramatized by Colman is entitled *The Iron Chest.*

Falstaff (*fâl'stăf*), **Sir John.**—A famous character in Shakespeare's comedy of the *Merry Wives of Windsor*, and in the first and second parts of his historical drama of *Henry IV.* He is as perfect a comic portrait as was ever sketched. In the former play he is represented as in love with Mrs. Ford and Mrs. Page, who make a butt and a dupe of him; in the latter he figures as a soldier and a wit; in both he is exhibited as a monster of fat—sensual, mendacious, boastful, and cowardly. In *Henry V.* his death is described by Mrs. Quickly.

Fang.—(1) A sheriff's officer, in the second part of Shakespeare's *King Henry IV.* (2) *Oliver Twist*, Charles Dickens. A bullying insolent magistrate, who would have sent Oliver Twist to prison, on suspicion of theft, if Mr. Brownlow had not interposed.

Fata Alcina.—*Orlando Innamorato*, Bojardo. Sister of Fata Morgana. She carried off Astolfo on the back of a whale to her isle, but turned him into a myrtle tree when she tired of him.

Fata Morgana (*fā'tä mor-gä'nä*).—The name of a potent fairy, celebrated in the tales of chivalry, and in the romantic poems of Italy. She was a pupil of the enchanter Merlin, and the sister of Arthur, to whom she discovered the intrigue of his queen, Geneura, or Guinever, with Lancelot of the Lake. In the *Orlando Innamorato* of Bojardo, she appears at first as a personification of fortune, inhabiting a splendid residence at the bottom of a lake, and dispensing all the treasures of the earth, but she is afterward found in her proper station subject to the all potent Demogorgon. Also, as sister to King Arthur and pupil of Merlin. She lived at the bottom of the lake and dispensed good fortune as she liked.

Fat Boy, The.—A laughable character in Dickens' *Pickwick Papers;* a youth of astonishing obesity whose employment consists in alternate eating and sleeping.

Fathom, Ferdinand, Count.—The title of a novel by Smollett, and the name of its principal character, a complete villain, who proceeds step by step to rob his benefactors and finally dies in misery and despair.

Fatima (*fā'tē-mä*).—(1) A female worker, in the story of *Aladdin*, in the *Arabian Nights' Entertainments.* (2) The last of the wives of Bluebeard, and the only one who escaped being murdered by him.

Faust (*foust*).—A celebrated tragedy by Goethe, the materials of which are drawn in part from the popular legends of Dr. Faustus, a famous magician of the sixteenth century. A rich uncle having left him a fortune, Faust ran to every excess, and, when his fortune was exhausted, made a pact with the devil (who assumed the name of Mephistopheles, and the appearance of a little gray monk), that, if he might indulge his propensities freely for twenty-four years, he would at the end of that period consign to the devil both body and soul. The compact terminated in 1550, when Faust disappeared. His sweetheart was Margherita, whom he seduced, and his faithful servant was Wagner.

Faustus (*fâs'tus*).—A tragedy name; represented as a vulgar sorcerer tempted to sell his soul to the devil (Mephistopheles), on condition of having a familiar spirit at his command, the possession of earthly power and glory, and unlimited gratification of his sensual appetites, for twenty-four years; at the end of which time, when the forfeit comes to be exacted, he shrinks and shudders in agony and remorse, imploring yet despairing of the mercy of heaven. This has been the theme of many writers. It is the subject of an opera by Gounod.

Femmes Savantes (*fam sä-văn'*), **Les** (or, *The Learned Women*).—Comedy by Molière. These women go in

for women's rights, science, and philosophy, to the neglect of domestic duties and wifely amenities. The "blue-stockings" are (1) Philaminte, the mother of Henriette, who discharges one of her servants because she speaks bad grammar; (2) Armande, sister of Henriette, who advocates platonic love and science; and (3) Bélise, sister of Philaminte, who sides with her in all things, but imagines that everyone is in love with her. Henriette, who has no sympathy with these "lofty flights," is in love with Clitandre; but Philaminte wants her to marry Trissotin, a *bel esprit*. However, the father loses his property through the "savant" proclivities of his wife, Trissotin retires, and Clitandre marries Henriette, the "perfect" or thorough woman.

Fenella.—A fairy-like creature, a deaf and dumb attendant on the countess of Derby, in Sir Walter Scott's *Peveril of the Peak*.

Fenton (*fen'ton*).—A character in Shakespeare's *Merry Wives of Windsor*, who wooes the rich Anne Page for her money, but soon discovers inward treasures in her which quite transform him.

Feramorz (*fer'a-môrz*).—*Lalla Rookh*, Thomas Moore. Feramorz in *Lalla Rookh* is the young Cashmerian poet, who relates poetical tales to Lalla Rookh, in her journey from Delhi to Lesser Bucharia. Lalla Rookh is going to be married to the young sultan, but falls in love with the poet. On the wedding morn she is led to her future husband, and finds that the poet is the sultan himself, who had gallantly taken this course to win the heart of his bride and beguile her journey.

Ferdinand (*fer'di-nand*).—(1) A character in Shakespeare's *Tempest*. He is a son of the king of Naples, and falls in love with Miranda, the daughter of Prospero, a banished duke of Milan. (2) King of Navarre, character in *Love's Labor's Lost*.

Ferrers (*fer'erz*)—*Endymion*. The hero of Benjamin Disraeli's novel *Endymion*.

Ferrex and Porrex.—Two sons of Gorboduc, a mythical British king. Porrex drove his brother from Britain, and when Ferrex returned with an army he was slain, but Porrex was shortly after put to death by his mother. One of the first, if not the very first, historical plays in the English language was *Ferrex and Porrex*, by Thomas Norton and Thomas Sackville.

Fib.—*Nymphidia*, Drayton. One of the fairy attendants to Queen Mab.

Fidele (*fi-dē'lē*, or *fi-dāl'*).—Subject of an elegy by Collins.

Fidelie.—*Cymbeline*, Shakespeare. The name assumed by Imogen, when, attired in boy's clothes, she started for Milford Haven to meet her husband Posthumus.

Fidessa.—*Faërie Queene*, Spenser. The companion of Sansfoy; but when the Red-cross Knight slew that "faithless Saracen," Fidessa turned out to be Duessa, the daughter of Falsehood and Shame. See "Duessa."

Figaro (*fē'gä-rō*).—A character introduced by Beaumarchais in his plays *Le Barbier de Seville*, *Le Mariage de Figaro*, and *La Mère Coupable*, used later by Mozart, Paisiello, and Rossini in operas. In the *Barbier* he is a barber; in the *Mariage* he is a valet. In both he is gay, lively, and courageous; his stratagems are always original, his lies witty, and his shrewdness proverbial. In the *Mère Coupable* he has become virtuous and has lost his nerve. He also appears in Holcroft's *Follies of a Day*, taken from Beaumarchis' *Mariage de Figaro*.

Finetta (*fi-net'tä*).—*The Cinder Girl*. A fairy tale by the Comtesse d'Aulnoy. This is merely the old tale of Cinderella slightly altered.

Fingal (*fing'gal*).—A mythical hero, whose name occurs in Gaelic ballads and traditions, and in Macpherson's *Poems of Ossian*.

Fleance (*flē'ans*).—A son of Banquo, in Shakespeare's tragedy of *Macbeth*. The legend relates that after the assassination of his father he escaped to Wales, where he married the daughter of the reigning prince, and had a son named Walter. This Walter afterward became lord high steward of Scotland, and called himself Walter the Steward. From him proceeded in a direct line the Stuarts of Scotland, a royal line which gave James VI. of Scotland, James I. of England. This myth has been seriously accepted by some as fact.

Fledgeby.—*Our Mutual Friend*, Dickens. An overreaching, cowardly sneak who pretends to do a decent business under the trade name of Pubsey & Co.

Florentius.—A knight whose story is related in the first book of Gower's *Confessio Amantis*. He bound himself to marry a deformed hag, provided she taught him the solution of a riddle on which his life depended.

Florian (*flō-ryon'*).—*The Foundling of the Forest*, W. Dimond. Discovered in infancy by the Count de Valmont, and adopted as his own son, Florian is lighthearted and volatile, but with deep affection, very grave, and the delight of all who know him.

Florimel (*flor'i-mel*).—A female character in Spenser's *Faërie Queene*, of great beauty, but so timid that she feared the "smallest monstrous mouse that creeps on floor," and was abused by everyone. She was noted for sweetness of temper amid great trials. The word Florimel signifies "honey-flower."

Florizel (*flor'i-zel*).—A prince of Bohemia, in Shakespeare's *Winter's Tale*, in love with Perdita.

Fluellen (*flō-el'en*).—A Welsh captain, who is an amusing pedant, in Shakespeare's *Henry V*.

Flying Dutchman.—A spectral ship, seen in stormy weather off the Cape of Good Hope, and considered ominous of ill-luck. Captain Marryat has taken this theme for his novel *The Phantom Ship*.

Folk.—Fairies, also called "people," "neighbors," "wights." The Germans have their kleine volk (little folk), the Swiss their hill people and earth people. See *Fairies*.

Ford.—Mr. and Mrs. Ford are characters in *The Merry Wives of Windsor*. Mrs. Ford pretends to accept Sir John Falstaff's protestations of love, in order to punish him by her devices.

Fortinbras (*fôr'tin-bras*).—Prince of Norway, in Shakespeare's tragedy *Hamlet*.

Fortunatus (*fôr-tū-na'tus*).—The hero in one of Straparolla's fairy tales. The nursery tale of Fortunatus records that he had an inexhaustible purse. It is from the Italian fairy tales.

Fortunio's (*fôr-tu'ni-o*) **Horse.**—Comrade not only possessed incredible speed, but knew all things, and was gifted with human speech.

Francesco.—The Iago of Massinger's *Duke of Milan*.

Francesca da Rimini (*frän-ches'kä dä rē'mē-nē*).—A dramatic poem by James Henry Leigh Hunt published in 1816. Francesca was the daughter of Guido da Polenta, Lord of Ravenna, in the latter part of the thirteenth century, and was married to Lanciotto, son of Malatesta da Rimini, who, discovering her criminal intercourse with his brother, revenged himself by putting them both to death. Her story forms an episode in Dante's *Inferno*.

Frankenstein (*fräng'ken-stīn*) (or, the *Modern Prometheus*).—A novel by Mrs. Shelley, published in 1818. It was commenced in the summer of 1816, when Byron and the Shelleys were residing on the banks of the Lake of Geneva, and when, "during a week of rain, having amused themselves with reading German ghost stories, they agreed at last to write something in imitation of them. 'You and I,' said Lord Byron to Mrs. Shelley, 'will publish ours together.' He then began his tale of the *Vampire*;" but "the most memorable result," writes Moore, "of their story-telling compact, was Mrs. Shelley's wild and powerful romance of *Frankenstein*, one of those original conceptions that take hold of the public mind at once and forever."

The hero of the book, a native of Geneva, and a student, constructs a monster of grewsome human remains and gives it life by galvanism. The monster feels that he is unlike all other human beings, and in revenge for the injury inflicted upon him by his creator, murders his friend, his brother, and his bride, and finally seeks out Frankenstein himself, with a view to wreaking a similar revenge on him. The hero, however, happily escapes his enemy, who retires to the utmost extremity of the globe, in order to put an end to his miserable life; and Frankenstein himself falls ill and dies on his way home after his last final flight from the monstrosity whom he has himself brought into the world.

Freeport, Sir Andrew.—The name of one of the members of the imaginary club under whose direction the *Spectator* was professedly published. He is represented as a London merchant of great eminence and experience, industrious, sensible and generous.

French Revolution, The.—A history, in three parts, by Thomas Carlyle, published in 1837, and described by Lowell as "a series of word-pictures, unmatched for vehement power, in which the figures of such sons of earth as Mirabeau and Danton loom gigantic and terrible as in the glare of an eruption; their shadows swaying far and wide, grotesquely awful. But all is painted by eruptive flashes in violent light and shade. There are no half tints, no gradations, and we find it impossible to account for the continuance in power of less Titanic actors in the tragedy, like Robespierre, on any theory, whether of human nature or of individual character, supplied by Mr. Carlyle."

Friar Lawrence.—The Franciscan monk who attempted to befriend the lovers in *Romeo and Juliet*.

Friar Tuck.—Chaplain and steward of Robin Hood. Introduced by Sir Walter Scott in *Ivanhoe*. He is a self-indulgent, combative Falstaff, a jolly companion to the outlaws in Sherwood forest.

Friday.—Robinson Crusoe's faithful man Friday pictured by Defoe.

Froissart (*froi'särt*).—*The Cronicles of England, Fraunce, Spayne, Portyugale, Scotlande, Bretayne, Flanders, and other places adjoynynge, translated out of Frenche into our maternalle Englysche Tonge*, by "John Bourchier, knight, Lord Berners." Printed in 1523. The history extends from 1326 to 1400. Froissart resided in England as secretary to Queen Philippa from 1361 to 1366, and visited it again in 1395, when he paid a visit to Scotland.

Frollo, Archdeacon Claude.—A noted character in Victor Hugo's *Notre Dame de Paris*, absorbed in a bewildering search for the philosopher's stone.

Front de Bœuf.—*Ivanhoe*, Sir Walter Scott. A follower of Prince John of Anjou, and one of the knight's challengers.

Froth, Master.—A foolish gentleman in Shakespeare's *Measure for Measure*. His name explains his character.

Fusbos (*fus'bos*).—*Utopia*, Sir Thomas More. Minister of state to Artaxaminous, king of Utopia.

Fyrapel, Sir.—The Leopard, the nearest kinsman of King Lion, in the beast epic of *Reynard the Fox*.

G

Gadshill.—A companion of Sir John Falstaff, in the first part of Shakespeare's *King Henry IV*.

Galahad (*gal'a-had*), **Sir.**—A celebrated knight of the Round Table who achieved the quest of the Holy Grail. Tennyson has made him the subject of one of his idylls. In Malory he is also represented as the perfect knight, clad in wonderful armor. He was the only knight who could sit in the "Siege Perilous" a seat reserved for the "knight without a flaw," who achieved the quest of the "Holy Grail."

Galapas (*gal'a-pas*).—A giant of marvelous height in the army of Lucius, king of Rome. He was slain by King Arthur.

Galaphrone, or **Galafron.**—A king of Cathay and father of Angelica in Bojardo's *Orlando Innamorato* and Ariosto's *Furioso*.

Gamp, Mrs.—A nurse who is a prominent character in Dickens' novel of *Martin Chuzzlewit*. She is celebrated for her constant reference to a certain Mrs. Harris, a purely imaginary person, for whose feigned opinions and utterances she professes the greatest respect, in order to give the more weight to her own.

Gan, Ganelone, Ganelon, or **Gano.**—The character of Sir Ganelon was marked with spite, dissimulation, and intrigue, but he was patient, obstinate, and enduring. He loved solitude, disbelieved in the existence of moral good, and has become a byword for a false and faithless friend. Dante has placed him in his *Inferno*.

Gander-Cleugh.—"Folly-Cliff," that mysterious place where a person make a goose of himself, in *Tales of My Landlord*, Sir Walter Scott.

Garcia, Pedro.—A mythical personage, of whom mention is made in the preface to Gil Blas, in which is related how two scholars of Salamanca discovered a tombstone with the inscription "Here lies interred the soul of the Licentiate Pedro Garcia," and how, on digging beneath the stone, was found a leathern purse containing a hundred ducats.

Gareth.—In *Arthurian Romance* a knight of the Round Table, who was first a scullion in King Arthur's kitchen, but afterward became champion of the Lady Linet, or Lynette, whose sister Lionès, or Lyonors, he delivered from Castle Perilous.

Gargantelle (*gär-ga-nel'*).—The mother of Gargantua in Rabelais' celebrated romance of this name.

Gargantua (*gär-gan'tū-ä*).—Rabelais' celebrated romance, the hero of which is a gigantic personage, about whom many wonderful stories are related. He lived for several centuries, and at last begot a son, Pantagruel, as wonderful as himself. The *Pleasant Story of the Giant Gargantua and of his Son Pantagruel*, so satirized the monastic orders of his time that it was denounced by the spiritual authorities. Francis I., however, protected the author, and allowed him to print the third part of it in 1545.

Gargery (*gar'jer-i*), **Mrs. Joe.**—*Great Expectations*, Dickens. Pip's sister. A virago, who kept her husband and Pip in constant awe. Joe Gargery, a blacksmith, married to Pip's sister. A noble-hearted, simple-minded young man, who loved Pip sincerely. Joe Gargery was one of nature's gentlemen.

Gaspar, or **Caspar.**—(The white one), one of the three magi or kings of Cologne. His offering to the infant Jesus was frankincense, in token of divinity.

Gaunt, Griffith.—Hero of a novel by Charles Reade, of same title.

Gavotte.—Name given to a certain dance common among people in the upper Alps.

Gawain, or **Gawayne** (*gä'wān*), **Sir.**—A nephew of King Arthur, and one of the most celebrated knights of the Round Table; noted for his sagacity and wonderful strength. He was surnamed "the courteous." His brothers were Agravaine, Gaheris, and Gareth.

Gebir (*gä'bēr*).—A legendary eastern prince, said to have invaded Africa and to have given his name to Gibraltar. He is the subject of a poem of the same name by Walter Savage Landor.

Gellatley (*gel'at-li*), **Davie.**—The name of a poor fool in Sir Walter Scott's novel of *Waverley*.

Geneviève (*zhen-vyäv'*).—(1) The heroine of a ballad by Coleridge. (2) Under the form *Genovefa*, the name occurs in a German myth as that of the wife of the Count Palatine Siegfried, in the time of Charles Martel. Upon false accusations her husband gave orders to put her to death, but the servant intrusted with the commission suffered her to escape into the forests of Ardennes, where she lay concealed, until by accident his husband discovered her retreat, and recognized her innocence.

Genevra.—A lady in Aristo's *Orlandos' Furioso*. Her honor is impeached, and she is condemned to die unless a champion appears to do combat for her. Her lover, Ariodantes, answers the challenge, kills the false accuser, and weds the dame. Spenser has a similar story in the *Faërie Queene*, and Shakespeare availed himself of the main incident in his comedy of *Much Ado About Nothing*.

Geraint (*ge-rānt*), **Sir.**—One of the knights of the Round Table. His story is told in Tennyson's *Idylls of the King* under *Geraint and Enid*.

Geraldine.—A name frequently found in romantic poetry, especially Scott's *Lay of the Last Minstrel*. The name is said to have been adopted from the heroine connected with Surrey, whose praises are celebrated in a famous sonnet.

Gertrude of Wyoming.—Heroine of a poem by Thomas Campbell.

Gesta Romanorum (*jes'tä rō-ma-nō'rum*).—A collection of old romances compiled by Pierre Bercheure, prior of the Benedictine convent of St. Eloi, Paris. Shakespeare, Spenser, Gower, and many later writers have gone to this source. It took its present form in England about the beginning of the fourteenth century, the foundation coming from Roman writers, to which were added religious and mystical tales.

Giaour (*jour*), **The.**—Byron's tale called *The Giaour* is represented as told by a fisherman, a Turk, who had committed a crime which haunted him all his life. See *Hassan*.

Gibbie, Goose.—A half-witted boy in Scott's *Old Mortality*.

Gibbie, Sir.—A simple-hearted, fine character in George Macdonald's novel by the same name.

Giant Despair.—*Pilgrim's Progress*, Bunyan. A giant who is the owner of Doubting Castle, and who, finding Christian and Hopeful asleep upon his grounds, takes them prisoners, and thrusts them into a dungeon.

Giant Grim.—*Pilgrim's Progress*, Bunyan. A giant who seeks to stop the march of the pilgrims to the Celestial City, but is slain in a duel by Mr. Great-heart, their guide.

Giant Slay-good.—*Pilgrim's Progress*, Bunyan. A giant slain in a duel by Mr. Great-heart.

Gil Blas (*zhēl blās*).—A romance by Le Sage. The hero is the son of Blas of Santillanê, squire or "escudero" to a lady, and brought up by his uncle, Canon Gil Perês. Gil Blas went to Dr. Godinez's school of Oviedo and obtained the reputation of being a great scholar. He had fair abilities, a kind heart, and good inclinations, but was easily led astray by his vanity. Full of wit and humor, he was lax in his morals. Duped by others at first, he afterward played the same devices on those less experienced. As he grew in years, however, his conduct improved, and when his fortune was made, he became an honest, steady man.

Glaucus (*glâ'kus*).—A fisherman of Bœotia who has become the fisherman's patron deity.

Glaucus.—Son of Hippolytus. Being smothered in a tub of honey, he was restored to life by Æsculapius.

Gloriana.—In Spenser's *Faërie Queene*, the "greatest glorious queen of Faëry land."

Glumdalca (*glum-dal'kä*).—*Tom Thumb*, Fielding. Queen of the giants, captive in the court of King Arthur.

Glumdalclitch (*glum-dal'klich*).—*Gulliver's Travels*, Swift. A girl nine years old "and only forty feet high." Being such a "little thing," the charge of Gulliver was committed to her during his sojourn in Brobdingnag.

Glumms.—*Peter Wilkins*, Robert Pullock. The male population of the imaginary country Nosmubdsgrsutt, visited by Peter Wilkins. Both males and females had wings which served both for flying and for clothes.

Godiva (*gō-dī'vä*).—A poem by Alfred Tennyson. The story of the lady and *Peeping Tom of Coventry* is told in full by Dugdale. Godiva was the wife of Leofric, earl of Mercia, and undertook to ride naked through the town if he would remit a tax under which the people groaned. The earl consented and the lady kept her word.

Golden Ass, The.—A romance in Latin by Apuleius. It is the adventures of Lucian, a young man who had been transformed into an ass, but still retained his human consciousness. It tells us the miseries which he suffered at the hands of robbers, eunuchs, magistrates, and so on, till the time came for him to resume his proper form. It is full of wit, racy humor, and rich fancy, and contains the exquisite episode of Cupid and Psyche.

Golden Legend, The.—The title of an ecclesiastical work in one hundred and seventy-seven sections, dating from the thirteenth century, written by one James de Voragine, a Dominican monk, and descriptive of the various saints' days in the Roman calendar. It is deserving of study as a literary monument of the period, and as illustrating the religious habits and views of the Christians of that time.

Goneril (*gon'er-il*).—The oldest of the three daughters to King Lear, in Shakespeare's tragedy. Having received her moiety of Lear's kingdom, the unnatural daughter first abridged the old man's retinue, then gave him to understand that his company was not wanted and sent him out a despairing old man to seek refuge where he could find it. Her name is proverbial for filial ingratitude.

Gonzalo (*gon-zä'lō*).—An honest old counselor in Shakespeare's *Tempest*, a true friend to Prospero.

Goody Blake.—A character in Wordsworth's poem entitled *Goody Blake and Harry Gill*. A farmer forbids old Goody Blake to carry home a few sticks, which she had picked up from his land, and in revenge she invokes upon him the curse that he may "never more be warm;" and ever after "his teeth they chatter, chatter still."

Goody Two-Shoes.—The name of a well-known character in a nursery tale by Oliver Goldsmith. Goody Two-Shoes was a very poor child, whose delight at having a pair of shoes was unbounded. She called constant attention to her "two-shoes" which gave her the name.

Gradgrind (*grad'grind*).—A hardware merchant in Dickens' *Hard Times*. He is a man of hard facts and cultivates the practical. His constant demand in conversation is for "facts." He allows nothing for the weakness of human nature, and deals with men and women as a mathematician with his figures.

Gradgrind, Mrs.—Wife of Thomas Gradgrind. A little, thin woman, always taking physic, without receiving from it any benefit.

Gradgrind, Tom.—Son of the above, a sullen young man, much loved by his sister.

Gradgrind, Louise.—A faithful daughter and sister.

Grandison, Sir Charles.—The hero of Richardson's novel *The History of Sir Charles Grandison*. Designed to represent his ideal of a perfect hero—a union of the good Christian and the perfect English gentleman.

Gratiano (*grä-tē-ä'no*).—A friend to Antonio and Bassanio in Shakespeare's *Merchant of Venice*. He "talks an infinite deal of nothing, more than any man in Venice." (2) Brother to Brabantio, in Shakespeare's tragedy of *Othello*. (3) A character in the Italian popular theater called *Commedia dell' Arte*. He is represented as a Bolognese doctor, and has a mask with a black nose and forehead and red cheeks.

Great-Heart, Mr.—In Bunyan's *Pilgrim's Progress*, the guide of Christian's wife and children upon their journey to the Celestial City.

Gremio (*grē'mi-ō*).—In Shakespeare's *Taming of the Shrew*, an old man who wishes to wed Bianca.

Griffin-feet.—*Fairy Tales*, Comtesse d'Aulnoy. The mark by which the Desert Fairy was known in all her metamorphoses.

Grimalkin.—A cat, the spirit of a witch. Any witch was permitted to assume the body of a cat nine times.

Grimwig.—*Oliver Twist*, Dickens. An irascible old gentleman, who hid a very kind heart under a rough exterior. He was always declaring himself ready to "eat his head" if he was mistaken on any point on which he passed an opinion.

Griselda (*gri-zel'dä*), **The Patient.**—A lady in Chaucer's *Clerk of Oxenford's Tales*, immortalized by her virtue and her patience. The model of womanly and wifely obedience, she comes victoriously out of cruel and repeated ordeals. The story of Griselda is first told in the Decameron. Boccaccio derived the incidents from Petrarch, who seems to have communicated them also to Chaucer, as the latter refers to Petrarch as his authority.

Grub Street, London, is thus described in Dr. Johnson's dictionary: "Originally the name of a street near Moorfields, in London, much inhabited by writers of small histories, dictionaries, and temporary poems, whence any production is called Grub street." The name was freely used by Pope, Swift, and others.

Grundy.—"What will Mrs. Grundy say?" (What will our rivals or neighbors say?) The phrase is from Tom Morton's *Speed the Plough*, but "Mrs. Grundy" is not introduced into the comedy as one of the *dramatis personæ*. The solicitude of Dame Ashfield, in this play, as to "what will Mrs. Grundy say?" has given the latter great celebrity, the interrogatory having acquired a proverbial currency.

Gudrun (*gö-drön'*).—*Edda*, Sämund Sigfusson. A lady, married to Sigurd by the magical arts of her mother and on the death of Sigurd to Atli (Attila), whom she hated for his cruelty, and murdered. She then cast herself into the sea, and the waves bore her to the castle of King Jonakun, who became her third husband.

Gudrun.—North-Saxon poem. A model of heroic fortitude and pious resignation. She was the daughter of King Hettel (Attila), and the betrothed of Herwig, king of Heligoland.

Guendolen (*gwen'dō-len*).—A fairy whose mother was a human being.

Guildenstern.—The name of a courtier in Shakespeare's tragedy *Hamlet*.

Guinevere (*gwin'e-ver*), or **Guenever.**—A corrupt form of *Guanhumara*, daughter of King Leodegrance of the land of Camelyard. She was the most beautiful of women, was the wife of King Arthur, but entertained a *liaison* with Sir Launcelot du Lac. Arthur, when informed of the conduct of Launcelot, went with an army to Brittany to punish him. Mordred, left as regent, usurped the crown, proclaimed that Arthur was dead, and tried to marry Guinevere; but she shut herself up in the Tower of London, resolved to die rather than marry the usurper. When she heard of the death of Arthur, she stole away to Almesbury, and became a nun.

Gulliver, Lemuel.—The imaginary hero of Swift's celebrated satirical romance known as *Gulliver's Travels*. He is represented as being first a surgeon in London, and then a captain of several ships. After having followed the sea for some years he makes in succession four extraordinary voyages.

Gummidge (*gum'ij*), **Mrs.**—In Dickens' novel of *David Copperfield*, described herself as a "lone, lorn, creetur, and everythink that reminds me of creeturs that ain't lone and lorn goes contrairy with me."

Gurton, Gammer.—The heroine of an old English comedy, long supposed to be the earliest in the language.

Guy Mannering.—The second of Scott's historical novels, published in 1815, just seven months after *Waverley*. The interest of the tale is well sustained; but the love scenes, female characters, and Guy Mannering himself are quite worthless. Not so the character of Dandy Dinmont, the shrewd and witty counselor Pleydell, the desperate, sea-beaten villainy of Hatteraick, the uncouth devotion of that gentlest of all pedants, poor Dominie Sampson, and the savage, crazed superstition of the gypsy-dweller in Derncleugh.

Guyon (*gī'on*).—The impersonation of Temperance or Self-government in Spenser's *Faërie Queene*. He destroyed the witch Acrasia, and her bower, called the "Bower of Bliss." His companion was Prudence. Sir Guyon represents the quality of temperance in the largest sense; meaning the virtuous self-government which holds in check not only the inferior sensual appetites but also the impulses of passion and revenge.

Guy, Sir, Earl of Warwick.—The hero of a famous English legend, which celebrates the wonderful achievements by which he obtained the hand of his ladylove, the fair Felice, as well as the adventures he subsequently met with in a pilgrimage to the Holy Land. He is reputed to have lived in the reign of the Saxon King Athelstan. The romance of Sir Guy, mentioned by Chaucer in the *Canterbury Tales*, cannot be traced further back than the earlier part of the fourteenth century. His existence at any period is very doubtful.

H

Hadad.—One of the six wise men led by the guiding star to Jesus.

Hagen.—The murderer of Siegfried, in the German epic, the *Nibelungenlied*. He is a pale-faced dwarf, who knows everything and whose sole desire is mischief. After the death of Siegfried he seized the "Nibelung hoard," and buried it in the Rhine, intending to appropriate it. Kriemhild invited him to the court and had him slain.

Haidee (*hī-dē'*).—A beautiful young Greek girl in Byron's poem, *Don Juan*. She is called the "beauty of the Cyclades."

Hakim.—*The Talisman*, Scott. Saladin, in the disguise of a physician, visited Richard Cœur de Lion in sickness; gave him a medicine in which the "talisman" had been dipped, and the sick king recovered.

Hamlet.—A tragedy by Shakespeare. The chief character is Hamlet, prince of Denmark. Th ghost of his father appears to him, and urges him to avenge his murder upon his uncle. But the prince feigns madness, and puts off his revenge from day to day by "thinking too precisely on the event." Hamlet's mother had married Claudius, king of Denmark, after the death of her former husband. Claudius prepared poisoned wine, which he intended for Hamlet; but the queen, not knowing it, drank it, was poisoned and died. Hamlet, seeing his mother fall dead, rushed on the king and killed him almost by accident, and is killed himself by a poisoned rapier in the hands of Laertes.

Hanswurst (*häns'vŏrst*).—A pantomimic character formerly introduced into German comedies. It corresponds to the Italian *Macaroni*, the French *Jean Potage*, and the English *Jack Pudding*.

Hardcastle, Mr.—A character in Goldsmith's comedy of *She Stoops to Conquer*, represented as prosy and hospitable.

Hardcastle, Mrs.—A very "genteel" lady indeed. Tony Lumpkin is her son by a former husband.

Hard Times.—A novel by Dickens. Bounderby, a street Arab, raised himself to banker and cotton prince. When past fifty years of age he married Louisa, daughter of Thomas Gradgrind. The bank was robbed, and Bounderby believed Stephen Blackpool to be the thief, because he had dismissed him from his employ. The culprit was Tom Gradgrind, the banker's brother-in-law, who escaped out of the country. In the dramatized version, the bank was not robbed, but Tom removed the money to another drawer for safety.

Harlequin (*här'le-kin*, or *-'kwin*).—The name of a well-known character in the popular extemporized Italian comedy.

Harlowe, Clarissa.—The heroine of Richardson's novel entitled *The History of Clarissa Harlowe*. In order to avoid a marriage urged upon her by her parents, she casts herself on the protection of Lovelace, who grossly abuses the confidence thus reposed in him. He subsequently proposes to marry her, but Clarissa rejects the offer.

Haroun-al-Raschid (*hă-rōn'ăl-rash'id*).—Caliph of the Abbasside race, contemporary with Charlemagne, and, like him, a patron of literature and the arts. Many of the tales in the *Arabian Nights* are placed in the caliphate of Haroun-al-Raschid.

Harpagon (*ăr-pā-gŏn'*).—The hero of Molière's comedy of *L'Avare*, represented as a wretched miser.

Harpier, or **Harper.**—Some mysterious personage referred to by the witches in Shakespeare's tragedy *Macbeth*.

Hassan (*hăs'săn*).—*The Giaour*, Byron. Caliph of the Ottoman empire, noted for his hospitality and splendor. In his seraglio was a beautiful young slave named Leila, who loved a Christian called the Giaour. Leila is put to death by an emir, and Hassan is slain by the Giaour. Caliph Hassan has become the subject of popular romance.

Hassan, Al.—The Arabian emir of Persia, father of Hinda, in Moore's *Fire Worshipers*.

Hatto (*hăt'tō*).—In German legend, an archbishop of Mentz in the tenth century, who, for his hardheartedness to the poor in time of famine, was eaten by mice in the "Mouse Tower" on an island in the Rhine near Bingen. Robert Browning has made this legend the subject of a poem.

Havelock the Dane (*hav'e-lok*).—A fisherman, known as Grim, rescued an infant named Havelok, whom he adopted. This infant was the son of the king of Denmark, and when the boy was restored to his royal sire Grim was laden with gifts. He built the town which he called after his own name. This is the foundation of the mediæval tales about *Havelock the Dane*.

Hazlewood, Sir Robert.—The old baronet of Hazlewood.

Hazlewood, Charles.—*Guy Mannering*, Scott. Son of Sir Robert. In love with Lucy Bertram, whom he marries.

Heart of Midlothian, The.—A novel by Sir Walter Scott, published in 1818. It has for heroines Jeanie and Effie Deans. Among the other characters are Dumbiedykes and Madge Wildfire. It has often been dramatized. "The Heart of Midlothian" was the popular name for the tollbooth at Edinburgh, the capital of the county of Midlothian.

Heep, Uriah.—*David Copperfield*, Dickens. A detestable character, who, under the garb of the most abject humility, conceals a diabolic malignity. Mrs. Heep, Uriah's mother, was a character equally to be despised for her hypocritical assumption of humility.

Helena.—(1) A lady in Shakespeare's *Midsummer Night's Dream*, in love with Demetrius. (2) The heroine of Shakespeare's *All's Well That Ends Well*, in love with Bertram, who marries her against his will and leaves her, but is finally won by the strength of her affection. (3) A character in an old popular tale, reproduced in Germany by Tieck.

Hermann and Dorothea.—The hero and heroine of Goethe's poem of the same name.

Hermengyld (*her'men-gild*).—*Canterbury Tales*, Chaucer. The wife of the lord-constable of Northumberland. She was converted by Constance, but was murdered by a knight. Hermengyld at the bidding of Constance restored sight to a blind Briton.

Hermia (*her'mi-ä*).—A lady in Shakespeare's *Midsummer Night's Dream*, in love with Lysander.

Hermione.—The heroine of the first three acts of Shakespeare's *Winter's Tale*.

Hernani, or **Ernani.**—The hero of Victor Hugo's tragedy of the same name, and of Verdi's opera, founded on the play. He was a Spanish noble in revolt against the Emperor Charles V. and killed himself from a high sense of honor.

Hiawatha (*hi-a-wä'tä*, or *hī-a-wä'thä*), **The Song of.**—A poem by Henry Wadsworth Longfellow, written in the following peculiar measure:

Should you ask me, "Whence these storied?"
. . . . . .
I should answer, I should tell you,
. . . . . .
"I repeat them as I heard them
From the lips of Nawadaha,
The musician, the sweet singer."

The poem is entirely devoted to a description of life among the aboriginal tribes of America. It was published in 1855. Hiawatha is a mythical person believed by some of the North American Indians to have been sent among them to clear their rivers, forests, and fishing-grounds, and to teach them the arts of peace. When the white man came, then Hiawatha knew that the time of his departure was at hand, when he must go

To the kingdom of Ponemah,
The land of the Hereafter.

Highland Mary.—A song by Robert Burns, which Burns himself thought was in his happiest manner, and which refers, he says, to one of the most interesting passages of his youthful days. By this he means his attachment to Mary, a servant in the family of Mr. Hamilton, "who will be remembered," says Alexander Smith, "with Dante's Beatrice and Petrarch's Laura." It was arranged that the lovers should become man and wife, and that Mary should go to her friends to prepare for the wedding. But before her departure came the farewell scene so touchingly described in the poem:

Our parting was fu' tender;
And, pledging aft to meet again,
We tore oursels asunder:
But oh! fell death's untimely frost
That nipt my flower sae early!
Now green's the sod, and cauld's the clay,
That wraps my Highland Mary!

Hilda.—A New England girl of the most sensitive delicacy and purity of mind, in Hawthorne's romance, *The Marble Faun*. She is an artist, living in Rome, and typifies, perhaps, the conscience.

Hildebrand (*hil'de-brand*).—The Nestor of German romance, a magician and champion.

Hildesheim (*hil'des-hīm*).—In an old German legend, the monk of Hildesheim, doubting how a thousand years with God could be "only one day," listened to the melody of a bird, as he supposed, for only three minutes, but found that he had been listening to it for a hundred years.

Hobbididance.—The name of one of the fiends mentioned by Shakespeare in *Lear*, and taken from the history of the Jesuits' impostures.

Hohenlinden (*hō"en-lin'den*).—A poem by Thomas Campbell, published in 1802, celebrating the battle of Hohenlinden, gained by Moreau and the French over the Austrians. The poet visited the battle field on December 3, 1800.

Holofernes (*hol-ō-fer'nēz*).—(1) A pedant living in Paris, under whose care Gargantua is placed for instruction. (2) A pedantic schoolmaster in Shakespeare's *Love's Labor's Lost*.

Holt, Felix.—The hero of George Eliot's novel by the same name.

Home, Sweet Home.—A popular lyric contained in the drama of *Clari, the Maid of Milan*, by John Howard

Payne. The beautiful melody to which it has been wedded is said to be of Italian or Sicilian origin, though by some it is attributed to Sir Henry Rowley Bishop. Perhaps the latter merely arranged and harmonized it.

Homilies.—The latter entries in the Peterborough *Chronicle* and a few homilies are almost all that we have left of the literature of the twelfth century. Some of these homilies are copied or imitated from those of Ælfric.

Honeycomb (*hun'i-kōm*), **Will.**—One of the members of the imaginary club by whom the *Spectator* was professedly edited. He is distinguished for his graceful affectation, courtly pretension, and knowledge of the gay world.

Honeyman, Charles.—A fashionable preacher in Thackeray's novel, *The Newcomes*.

Hopeful.—A pilgrim in Bunyan's *Pilgrim's Progress*, who accompanies Christian to the end of his journey.

Hop-o'-my-Thumb.—A character in the tales of the nursery. Tom Thumb and Hop-o'-my-Thumb are not the same, although they are often confounded. Tom Thumb was the son of peasants, knighted by King Arthur, and was killed by a spider. Hop-o'-my-Thumb was a nix, the same as the German "*daumling*," the French "*le petit pouce*," and the Scotch "Tom-a-lin" or "Tamlane." He was not a human dwarf, but a fay.

Horatio (*hō-rā'shi-ō*).—*Hamlet*, Shakespeare. An intimate friend of Hamlet, a prince, a scholar, and a gentleman.

Horatius Cocles.—Captain of the bridge gate over the Tiber. He and two men to help him held the bridge against vast approaching armies. Subject and title of a poem by Lord Macauley.

Horner, Jack.—The name of a celebrated personage in the literature of the nursery. A Somersetshire tradition says that the plums which Jack Horner pulled out of the Christmas pie alluded to the title deeds of the abbey estates at Wells, which were sent to Henry VIII., in a pasty, and were abstracted on the way by the messenger, a certain Jack Horner.

Hortense (*hôr-ten's*, or *or-tons'*).—*Bleak House*, Dickens. The vindictive French maid-servant of Lady Dedlock. In revenge for the partiality shown by Lady Dedlock to Rosa, Hortense murdered Mr. Tulkinghorn, and tried to throw the suspicion of the crime on Lady Dedlock.

House of the Seven Gables, The.—A romance by Nathaniel Hawthorne, published in 1851. "In *The House of the Seven Gables*," says R. H. Hutton, "we have a picture studied to impress on us that both personal character and the malign influences of evil action are transmitted, sometimes with accumulating force, even through centuries, blighting every generation through which they pass. The subject would apparently involve a series of sketches, but only two are introduced from the past, and the family characteristics are so anxiously preserved as to make even these seem like slight modifications of some of the living group. The only incident in the tale is the light thrown upon a crime—which had been committed thirty years before the story opens—by the sudden death of the principal representative of a family from the same disease, in the same chair, and under the same circumstances, as those of the old ancestor and founder of the family, whose picture hangs above the chair."

Hubbard, Old Mother.—A well-known nursery rhyme. *Mother Hubbard's Tale*, by Edmund Spenser, is a satirical fable in the style of Chaucer.

Hubert de Burgh (*bŏrg*, or *berg*).—Justice of England, created Earl of Kent, introduced by Shakespeare into *King John*. He is the one to whom the young prince addresses his piteous plea for life. The lad was found dead soon afterward, either by accident or foul play.

Hubert, Saint.—The legend of Saint Hubert makes him a patron saint of huntsmen.

Hudibras (*hū'di-bras*).—The title and hero of a celebrated satirical poem by Samuel Butler. Hudibras is a Presbyterian justice of the time of the commonwealth.

Hugh of Lincoln.—A legendary personage who forms the subject of Chaucer's *Prioress' Tale*, and also of an ancient English ballad. Wordsworth has given a modernized version of this tale.

Hugo Hugonet.—*Castle Dangerous*, Scott. Minstrel of the earl of Douglas.

Humphrey.—The imaginary collector of the tales in *Master Humphrey's Clock*, by Charles Dickens.

Humpty Dumpty.—The hero of a well-known nursery rhyme. The name signifies humped and dumpy, and is the riddle for an egg.

Huon de Bordeaux (*ü-ôn'de bor-dō'*).—A hero of one of the romances of chivalry bearing this name.

Hural Oyun.—In the fairy tales found in the Koran, these are the black-eyed daughters of paradise. They are created from muck, and are free from all physical weakness and are always young. It is held out to every male believer that he will have seventy-two of these girls as his household companions in paradise.

Hylas (*hī'las*).—A beautiful boy, beloved by Hercules, who was drawn into a spring by the enamored nymphs. The story has been treated by Bayard Taylor, and by William Morris in his *Life and Death of Jason*.

Hypatia (*hī-pā'shiȧ*).—A novel by the Rev. Charles Kingsley, the scene of which is laid in Alexandria, at a time when Christianity was gaining ground against Paganism and the neo-Platonism of the schools. Hypatia herself was born about the year 370, and, after attracting to her lectures on philosophy a large and brilliant auditory, was torn to pieces by the rabble of her native city in 415. *Hypatia* appeared in 1853.

Hyperion (*hī-pē'ri-on*, or *hī-per-ī'on*).—A romance in four books, by Henry Wadsworth Longfellow. This work, which was the result of an extensive tour in Germany, was published in 1839, and with much that is purely fanciful and imaginative, contains much that came within the actual experience of the author who is represented, idealized, in the character of Paul Flemming. The episode with Mary Ashburton is supposed to have reference to a real occurrence. The book is full of description and of eloquent discussion, besides being interspersed with snatches of legend and of song.

Hypocrites' Isle.—An island described by Rabelais in one of his satires. He pictures this island of *Hypocrites* as wholly inhabited by people of low and defiled natures, as, by sham saints, spiritual comedians, seducers, and "such-like sorry rogues who live on the alms of passengers like the hermit of Lamont."

I

Iago (*ē-ä'gō*).—*Othello*, Shakespeare. Othello's ensign and the villain of the play. Iago is said to be a character next to a devil, yet not quite a devil, which Shakespeare alone could execute without scandal.

Idleness, The Lake of.—*Faërie Queene*, Spenser. Whoever drank thereof grew instantly "faint and weary." The Red Cross Knight drank of it, and was readily made captive by Orgoglio.

Idylls of the King.—A series of poems by Tennyson. Taken together they form a parable of the life of man. Each idyll taken as a separate picture represents the war between sense and soul. In *Lancelot and Guinevere* the lower nature leads them astray and there is intense struggle before the higher nature prevails. In *Vivien*, *Tristram*, and *Modred*, the base and sensual triumph. In *Arthur*, *Sir Galahad* and *Percivale*, it is the victory of the spiritual.

Ignaro.—*Faërie Queene*, Spenser. Fosterfather of Orgoglio. Spenser says this old man walks one way and looks another, because ignorance is always "wrong-headed."

Iliad (*il'ē-ad*).—A famous Greek epic poem by Homer. It is the tale of the siege of Troy, in twenty-four books. It is written in Greek hexameters, and commemorates the deeds of Achilles and other Greek heroes at the siege of Troy. Books one, two and three are introductory to the war. Paris proposes to decide the contest by a single combat, and Menelaus accepts the challenge. Paris, being overthrown, is carried off by Venus, and Agamemnon demands that the Trojans shall give up Troy in fulfillment of the compact, and the siege follows. The gods take part, and frightful slaughter ensues. At length Achilles slays Hector, and the battle is at an end. Old Priam, going to the tent of Achilles, craves the body of his son Hector; Achilles gives it up, and the poem concludes with the funeral rites of the Trojan hero. Vergil continues the tale from this point, shows how the city was taken and burnt, and then continues with the adventures of Æneas, who escapes from the burning city, and makes his way to Italy.

Imogen (*im'ō-jen*).—The wife of Posthumus, and the daughter of Cymbeline in the play of Shakespeare's under title *Cymbeline*. "Of all Shakespeare's women," says Hazlitt, "she is, perhaps, the most tender and the most artless."

Incantation.—Is derived from a Latin root meaning simply "to sing." It is the term in use to denote one of the most powerful and awe-inspiring modes of magic, resting on a belief in the mysterious power of words solemnly conceived and passionately uttered.

Inchcape Rock.—It is dangerous for navigators, and therefore the abbot of Aberbrothock fixed a bell on a float, which gave notice to sailors. Southey says that Ralph the Rover, in a mischievous joke, cut the bell from the buoy, and it fell into the sea; but on his

return voyage his boat ran on the rock, and Ralph was drowned. Precisely the same tale is told of St. Goven's bell.

Inferno, The.—*Divine Comedy*, Dante. Epic poem in thirty-four cantos. Inferno is the place of the souls who are wholly given up to sin. The ascent is through Purgatory to Paradise.

Ingoldsby Legends (*ing'gōldz-bi lej'endz*, or *lē'jendz*).—A collection of legends in prose and verse, supposed to have been found in the family chest of the Ingoldsby family, and related by Thomas Ingoldsby. Of the poetical pieces it is not too much to say that, for originality of design and diction, for quaint illustration and musical verse, they are not surpassed in the English language. From the days of Hudibras to our time, the drollery invested in rhyme has never been so amply or so felicitously exemplified; and if derision has been unsparingly applied, it has been to lash knavery and imposture.

In Memoriam.—A poem by Alfred Tennyson, published in 1850, and consisting of one hundred and thirty "short swallow flights of song," in a measure which Tennyson has made his own. It is well known that these "brief lays, of sorrow born," were written in memory of the author's friend, Arthur Henry Hallam, who died in 1833. They are characterized by George MacDonald as forming "the poem of the hoping doubters, the poem of our age—the grand minor organ fugue of *In Memoriam*. It is the cry of the bereaved Psyche into the dark infinite after the vanished love. His friend is nowhere in his sight, and God is silent. Death, God's final compulsion to prayer, in its dread, its gloom, its utter stillness, its apparent nothingness, urges the cry. Moanings over the dead are mingled with the profoundest questionings of philosophy, the signs of nature, and the story of Jesus, while now and then the star of the morning, bright Phosphor, flashes a few rays through the shifting cloudy dark. And if the sun has not arisen on the close of the book, yet the aurora of the coming dawn gives light enough to make the onward journey possible and hopeful."

Innocents Abroad.—By Mark Twain. Travelers seeing Europe without any illusions. The fun consists in an irreverent application of modern common sense to historic associations, ridiculing sentimental humbug. An air of innocence and surprise adds to the drolleries of their adventures.

Instauratio Magna (*in-stâ-rā'shi-ō mag'nä*).—The title (*The Great Restoration*) which Bacon gave to his *Magnum Opus*, the design of which was for six divisions:—(1) *The Advancement of Learning;* (2) the *Novum Organum;* (3) the *Experimental History of Nature;* (4) the *Scala Intellectus*, which leads from experience to science; (5) the *Bodronic*, or anticipations of the second philosophy; and (6) *Active Science*, or experiment. Of these, only the first two, and a portion of the third (*Sylva Sylvarum*), were published. The idea that was to run through the *Instauratio* was that invention must be based upon experience, and experience upon experiment.

Interludes, The.—Springing from the moralities and bearing some resemblance to them, though nearer the regular drama, are the interludes, a class of compositions in dialogue, much shorter and more merry and farcical. They were generally played in the intervals of a festival.

Invocation.—An address at the commencement of a poem, in which the author calls for the aid of some divinity, particularly of his muse.

Iphigenia (*if"i-jē-nī'ä*).—The heroine of Euripides' tragedy *Iphigenia in Aulis*, and of Geothe's tragedy *Iphigenia auf Tauris*. She was placed on the altar in a rash vow by her father. Artemis at the last moment snatched her from the altar and carried her to heaven, substituting a hind in her place. The similarity of this legend to the scripture stories of Jephthah's vow and Abraham's offering of his son Isaac is noticeable.

Iras.—A strongly delineated characted in *Ben Hur, a Tale of The Christ*, by Lew Wallace.

Iras.—A female attendant on Cleopatra in Shakespeare's play, *Antony and Cleopatra*.

Isaac of York.—A wealthy Jew, the father of Rebecca, in Sir Walter Scott's novel, *Ivanhoe*.

Isabella.—The heroine in Shakespeare's comedy, *Measure for Measure*.

Island of Lanterns.—In the celebrated satire of Rabelais, an imaginary country inhabited by false pretenders to knowledge. The name was probably suggested by the *City of Lanterns*, in the Greek romance of Lucian. Swift has copied this same idea in his *Island of Laputa*.

Island of St. Brandan.—A marvelous flying island, the subject of an old and widely spread legend of the middle ages. Though the island of St. Brandan has been a disappointment to voyagers, it has been a favorite theme with poets.

Island of the Blest.—Imaginary island in the west. Hither the favorites of the gods were conveyed without dying, and dwelt in never-ending joy. The name first occurs in Hesiod's *Works and Days*. This phrase is often used in modern literature.

Ithuriel (*i-thō'ri-el*).—In Milton's *Paradise Lost*, an angel commissioned by Gabriel to search through paradise, in company with Zephon, to find Satan, who had eluded the vigilance of the angelic guard, and effected an entrance into the garden. It is related that Ithuriel found Satan "squat like a toad, close at the ear of Eve," and transformed him by a touch of his spear into his proper shape.

Ivanhoe.—A novel by Sir Walter Scott. The hero, also Ivanhoe, figures as Cedric of Rotherwood's disinherited son, the favorite of King Richard I., and the lover of the Lady Rowena, whom, in the end, he marries. The scene is laid in England in the reign of Richard I., and we are introduced to Robin Hood in Sherwood forest, banquets in Saxon halls, tournaments, and all the pomp of ancient chivalry. Rowena, the heroine, is quite thrown into the shade by the gentle, meek, yet high-souled Rebecca.

Ivory Gate of Dreams.—Dreams which delude pass through the ivory gate, but those which come true through the horn gate.

J

Jack and the Bean-Stalk.—A nursery legend said to be an allegory of the Teutonic *Al-fader*, the "red hen" representing the all-producing sun, the "money-bags" the fertilizing rain, and the "harp" the winds.

Jack-in-the-Green.—A prominent character in May-pole dances.

Jack Robinson.—A famous comic song by Hudson.

Jack Sprat.—The hero of a nursery rhyme. Jack and his wife form a fine combination in domestic economy.

Jack the Giant-killer.—The name of a famous hero in the literature of the nursery, the subject of one of the Teutonic or Indo-European legends, which have become nationalized in England and America.

Jaquenetta (*jak-e-net'ä*).—*Love's Labor's Lost*, Shakespeare. A country wench courted by Don Adriano de Armado.

Jaques (*zhä'kes*).—A lord attending upon the exiled duke, in Shakespeare's *As You Like It*. A contemplative character who thinks and does—nothing. He is called the "melancholy Jaques," and affects a cynical philosophy. He could "suck melancholy out of a song, as a weasel sucks eggs."

Jarley, Mrs.—The proprietor of a waxwork show in Dickens' *Old Curiosity Shop*. She has lent her name to a popular game of parlor tableaux.

Jarndyce (*järn'dis*), **John.**—A prominent figure in Dickens' *Bleak House*, distinguished for his philanthropy, easy good-nature and good sense, and for always saying, "The wind is in the east," when anything went wrong with him. The famous suit of Jarndyce *vs.* Jarndyce, in this novel, is a satire upon the court of chancery.

Jarvie, Nicol.—A prominent character in Sir Walter Scott's novel *Rob Roy*. He is a bailie of Glasgow.

Javert (*zhä-var'*).—An officer of the police force in *Les Misérables*, by Victor Hugo. He is the incarnation of inexorable law.

Jarvis.—A faithful old servant, in Moore's *The Gamester*, who tries to save his master, Beverley, from his fatal passion of gambling.

Jaup.—An old woman at Middlemas village, in Scott's *The Surgeon's Daughter*.

Jekyll, Doctor, and Mr. Hyde.—A singular romance by Robert Louis Stevenson. The hero is a duplex character—Dr. Jekyll and Mr. Hyde. Doctor Jekyll is a benevolent and upright physician, who by means of a potion is able to transform himself for a time into a second personality, Mr. Hyde, of a brutal and animal nature.

Jellyby (*jel'i-bi*), **Mrs.**—A character in Dickens' novel, *Bleak House*, a type of sham philanthropy. She spends her time and energy on foreign missions to the neglect of her family. Mrs. Jellyby is quite overwhelmed with business correspondence relative to the affairs of Borrioboola Gha.

Jenkins, Winifred.—The name of Miss Tabitha Bramble's maid in Smollett's *Expedition of Humphrey Clinker*. She makes ridiculous blunders in speaking and writing.

Jenkinson, Ephraim.—A green old swindler, whom Dr. Primrose met in a public tavern. Dr. Primrose sold the swindler his horse, Old Blackberry, for a draft upon Farmer Flamborough.

Jeroboam (*jer-ō-bō'am*) **Sermon.**—One of Dr. Emmons' sermons, which made a great noise at the time. It was known as his Jeroboam Sermon. It was written on the occasion of Jefferson's inauguration as president, and, although Jefferson is not named, the delineation of the character of Jeroboam is such that no one can doubt the personal application intended.

Jerusalem Delivered.—An epic in twenty books, by Torquato Tasso. The crusaders, encamped on the plains of Tortosa, chose Godfrey for their chief, and Alandine, king of Jerusalem, made preparations for defense. The Christian army having reached Jerusalem, the king of Damascus sent Armida to beguile the Christians. It was found that Jerusalem could never be taken without the aid of Rinaldo. Godfrey, being informed that the hero was dallying with Armida in the enchanted island, sent to invite him back to the army; he returned, and Jerusalem was taken. Armida fled into Egypt, and offered to marry any knight who slew Rinaldo. The love of Rinaldo returned, he pursued her and she relented. The poem concludes with the triumphant entry of the Christian army into the Holy City, and their devotions at the tomb of the Redeemer. The two chief episodes are the loves of Olindo and Sofronia, and of Tancred and Clorinda.

Jessica (*jes'i-kă*).—The beautiful daughter of Shylock, in Shakespeare's *Merchant of Venice*.

Jones, Tom.—The hero of Fielding's novel entitled *The History of a Foundling*, represented as a model of generosity, openness, and manly spirit, though thoughtless and dissipated.

Joyeuse (*zhwä-yez'*).—The sword of Charlemagne as mentioned in romances of chivalry.

Joyeuse Garde (*zhwä-yez'gärd*).—The residence of the famous Lancelot du Lac.

Judith.—The heroine in the book by the same name in the Apocrypha. She was a beautiful Jewess of Bethulia, who, when her town was besieged by Holofernes, the general of Nebuchadnezzar, attended him in his tent, and, when he was drunk, killed him, whereupon her townsmen fell upon the Assyrians and defeated them with great slaughter. The tale is not mentioned by Josephus, and has, from an early period, been held to be an allegory. It has frequently furnished poets and painters with subjects.

Julius Cæsar.—An historical tragedy by William Shakespeare. The poet was in this, as in other plays, materially assisted by North's translation of Plutarch. "Shakespeare's *Julius Cæsar*," says Hazlitt, "is not equal, as a whole, to either of his other plays taken from the Roman history. It is inferior in interest to *Coriolanus*, and both in interest and power to *Antony and Cleopatra*. It, however, abounds in admirable and affecting passages, and is remarkable for the profound knowledge of character, in which Shakespeare could hardly fail."

K

Kadr, Al.—The night on which the *Koran* was sent down to Mohammed. Al Kadir is supposed to be the seventh of the last ten nights of Ramadan, or the night between the twenty-third and twenty-fourth days of the month.

Kay.—A foster brother of King Arthur, and a rude and boastful knight of the Round Table. He was the butt of King Arthur's court. Called also Sir Queux. He appears in the *Boy and the Mantle*, in Percy's *Reliques*. Sir Kay is represented as the type of rude boastfulness, Sir Gawain of courtesy, Sir Launcelot of chivalry, Sir Mordred of treachery, Sir Galahad of chastity, Sir Mark of cowardice.

Kehama (*kē-hä'mă*).—A Hindu rajah who obtains and sports with supernatural power. His adventures are related in Southey's poem entitled *The Curse of Kehama*.

Kenilworth.—A novel by Sir Walter Scott. This is very superior to *The Abbot* and *The Monastery*. For interest it comes next to *Ivanhoe*, and the portrait of Queen Elizabeth is lifelike and correct. That of Queen Mary is given in *The Abbot*. Full of courtly gayeties and splendor, the novel contains the unhappy tale of the beautiful Amy Robsart, which cannot fail to excite our sympathy and pity.

Kent, Earl of.—A rough, plain-spoken, but faithful nobleman in Shakespeare's *King Lear*, who follows the fallen fortunes of the king, disguised as a servant, under the assumed name of Caius.

Kenwigs (*ken'wiǵz*).—A family in Dickens' novel *Nicholas Nickleby*, including a number of little girls who differed from one another only in the length of their frilled pantalets and of their flaxen pigtails tied with bows of blue ribbon.

Kilkenny Cats.—Two cats, in an Irish story, which fought till nothing was left but their tails. It is probably a parable of a local contest between Kilkenny and Irishtown, which impoverished both boroughs.

Kilmansegg, Miss.—An heiress with great expectations and an artificial leg of solid gold, in Hood's poem, *A Golden Legend*.

King Horn.—A metrical romance which was very popular in the thirteenth century. King Horn is a beautiful young prince who is carried away by pirates; but his life is spared, and after many wonderful adventures he weds a princess, and regains his father's kingdom.

King Lear.—A tragedy by Shakespeare whose hero is a fabulous or legendary king of Britain. He had three daughters, and when four score years old, wishing to retire from the active duties of sovereignty, resolved to divide his kingdom between them, but was persuaded to disinherit Cordelia. The beauty of the play is the exquisite character of Cordelia, who is a "perfect woman."

King Log and King Stork.—Characters in a celebrated fable of Æsop, which relates that the frogs, grown weary of living without a government, petitioned Jupiter for a king. Jupiter accordingly threw down a log among them, which made a satisfactory ruler till the frogs recovered from their fright and discovered his real nature. They, therefore, entreated Jupiter for another king, whereupon he sent them a stork, who immediately began to devour them.

Klaus, Peter.—The hero of an old popular tradition of Germany—the prototype of Rip Van Winkle—represented as a goatherd.

Knickerbocker, Diedrich.—The imaginary author of a humorous fictitious *History of New York*, written by Washington Irving.

Knight of the Swan.—Lohengrin, son of Parsival, because his boat was drawn by a swan.

Knights of the Round Table.—King Arthur's knights were so called because they sat with him at a round table made by Merlin for King Leodogran. This king gave it to Arthur on his marriage with Guinevere, his daughter.

Koppenberg.—The mountain of Westphalia to which the pied piper (Bunting) led the children, when the people of Hamelin refused to pay him for killing their rats. Browning's poem, *The Pied Piper*, tells the tale.

L

Lady of Lyons, The.—A drama, by Lord Lytton, in which Pauline Deschappelles, daughter of a Lyonese merchant, rejects the suits of Beauseant, Glavis, and Claude Melnotte, who therefore combined. Claude, who was a gardener's son, aided by the other two, passed himself off as Prince Como, married Pauline, and brought her home to his mother's cottage. The proud beauty was very indignant, and Claude left her to join the French army. He became a colonel, and returned to Lyons. He found his father-in-law on the eve of bankruptcy, and that Beauseant had promised to satisfy the creditors if Pauline would consent to marry him. Pauline was heartbroken; Claude revealed himself, paid the money required, and carried home the bride.

Lady of Shalott, The.—A poem by Alfred Tennyson, founded on an incident in *King Arthur*. It is descriptive of "a being whose existence passes without emotion, without changes, without intelligible motive for living on, without hope or fear, here or hereafter."

Lady of the Lake, The.—A poem in six cantos by Sir Walter Scott, published in 1810. "Measured even by the standard of the *Minstrel* and *Marmion*, the *Lady of the Lake* possessed," says Palgrave, "merits of its own, which raised his reputation still higher. Jeffrey's prediction has been perfectly fulfilled, that the *Lady of the Lake* would be 'oftener read than either of the former,' and it is generally acknowledged to be, in Lockhart's words, 'the most interesting, romantic, picturesque, and graceful of his great poems.'" The descriptions of scenery, which form one of the chief charms of the poem, render it, even now, one of the most minute and faithful handbooks to the region in which the drama of Ellen and the Knight of Snowdon is laid.

Lake Poets, The.—Wordsworth, Southey, and Coleridge, who lived about the lakes of Cumberland.

Lalla Rookh (*lal'ä rök*).—An oriental romance by Thomas Moore, consisting of four tales in verse, entitled *The Veiled Prophet of Khorassan*, *Paradise and the Peri*, *The Fire-Worshipers*, and *The Light of the Harem*, and connected by a short prose narrative, in which it is described how Lalla Rookh, daughter of the Emperor Aurungzebe, journeys toward Bucharia to

meet her engaged husband, and how the prince gains her love on the way, in the guise of a Cashmerian minstrel. *Lalla Rookh* was published in 1817.

L'Allegro (*lăl-lä'grō*).—A descriptive poem by John Milton, probably written during his college life.

L'Amour Médecin (*la-mōōr' mäd-saN'*) (or, *The Love Doctor*).—A comedy by Molière, written about the year 1665. Lucinde, the daughter of Sganarelle, is in love, and the father calls in four doctors to consult upon the nature of her malady. They see the patient, and retire to consult together, but talk about Paris, about their visits, about the topics of the day; and when the father enters to know what opinion they have formed, they all prescribe different remedies, and pronounce different opinions. Lisette then calls in a "quack" doctor (Clitandre, the lover), who says he must act on the imagination, and proposes a seeming marriage, to which Sganarelle assents. The assistant being a notary, Clitandre and Lucinde are married.

Lampoon.—A personal satire, often bitter and malignant. These libels, carried to excess in the reign of Charles II., acquired the name of lampoons from the burden sung to them: "*Lampone, lampone, camerada lampone.*"

Land of Beulah.—The paradise in which souls wait before the resurrection. In *Pilgrim's Progress* the land from which the pilgrims enter the Celestial City. The name is found in Isaiah lxii., 4.

Land of Bondage.—Name given to Egypt in the Bible.

Land of Cakes.—A name sometimes given to Scotland, because oatmeal cakes are a common national article of food, particularly among the poorer classes.

Land of Nod.—In common speech sleepy-land or land of dreams.

Land of Promise.—The land promised to Abraham—Canaan.

Land of Shadows.—A place of unreality, sometimes meaning land of ghosts.

Land o' the Leal.—An unknown land of happiness, loyalty, and virtue. Caroline Oliphant, baroness Nairne, meant heaven in her song and this is now its accepted meaning.

Land of Wisdom.—A name given to Normandy, in France, because of the wise customs which have prevailed there, and also because of the skill and judgment of the people in making laws.

Land of Veda (*vē'dä*).—Name often given to India.

Landlady's Daughter.—She rowed Flemming "over the Rhine-stream, rapid and roaring wide," and told to him the story of the *Liebenstein.*

Last Days of Pompeii (*pom-pā'yē*), **The.**—A novel by Bulwer Lytton, Edward George, Baron Lytton, which was published in 1834. The interest of the book is one of situation and of action rather than of character. The scenes which linger on our memories longest are the noonday excursion on the Campanian seas, the temple of Isis, with its hidden machinery; the funeral pomp and dirge of the murdered Apæcides, Lydon perishing in the unequal struggle; the price which was to have been paid for a father's liberty; and lastly, the grand catastrophe, a subject which called forth all Lord Lytton's brilliant powers.

Last of the Mohicans.—The Indian chief Uncas is so called by Cooper in his novel of that title.

Launfal (*lăn'fal*), **Sir.**—Steward of King Arthur. James Russell Lowell has a poem entitled *The Vision of Sir Launfal.*

Lavaine.—Son of the lord of Astolat, who accompanied Sir Lancelot when he went to tilt for the ninth diamond. Lavaine is described as young, brave, and a true knight. He was brother to Elaine.

Lavinia (*la-vin'i-ä*) **and Palemon.**—Lavinia was the daughter of Acasto, patron of Palemon. Through Acasto Palemon gained a fortune and wandered away from his friend. Acasto lost his property, and dying, left a widow and daughter in poverty. Palemon often sought them, but could never find them. One day, a lovely modest maiden came to glean in Palemon's fields. The young squire was greatly struck with her exceeding beauty and modesty, but she was known as a pauper and he dared not give her more than a passing glance. Upon inquiry he found that the beautiful gleaner was the daughter of Acasto; he proposed marriage, and Lavinia was restored to her rightful place.

Leonato (*lē-ō-nä'tō*).—Governor of Missina in Shakespeare's *Much Ado About Nothing.* He prematurely accredited the accusations against his daughter, Hero.

Leonine (*lē'ō-nīn*).—In Shakespeare's *Pericles.* Servant to Dionyza. The latter conspired with him to murder Marina, and was saved from the crime only by the intervention of pirates.

Léonore (*lā-ō-nōr'*).—In Molière's *L'ecole des Maris,* sister of Isabelle, an orphan; brought up by Ariste according to his notions of training a girl to make him a good wife. He put her on her honor, tried to win her confidence and love, gave her all the liberty consistent with propriety and social etiquette, and found that she loved him, and made a fond and faithful wife.

Leviathan (*lē-vi'a-than*) (or, the *Matter, Form, and Power of a Commonwealth, Ecclesiastical and Civil*).—A work by Thomas Hobbes, published in 1651. In *Leviathan,* Hobbes' peculiar theories in politics received their fullest and ablest expression. They found an illustrious opponent in Lord Clarendon, who, in 1676, published *A Brief View and Survey of the Dangerous and Pernicious Errors to Church and State in Mr. Hobbes' book Entitled Leviathan.*

Little Dorrit.—The heroine and title of a novel by Charles Dickens. Little Dorrit was born and brought up in the Marshalsea prison, Bermondsey, where her father was confined for debt; and when about fourteen years of age she used to do needlework, to earn a subsistence for herself and her father. The child had a pale, transparent face; was quick in expression, though not beautiful in feature. Her eyes were a soft hazel, and her figure slight. The little dove of the prison was idolized by the prisoners, and when she walked out, every man in Bermondsey who passed her, touched or took off his hat out of respect to her good works and active benevolence. Her father, coming into a property, was set free at length, and Little Dorrit married Arthur Clennam, the marriage service being celebrated in the Marshalsea, by the prison chaplain.

Little John.—A big, stalwart fellow, named John Little, who encountered Robin Hood, and gave him a sound thrashing, after which he was rechristened, and Robin stood godfather. Little John is introduced by Sir Walter Scott in *The Talisman.*

Little Nell.—*Old Curiosity Shop,* Dickens. The prominent character of the story, pure and true, though living in the midst of selfishness and crime. She was brought up by her grandfather, who was in his dotage, and who tried to eke out a narrow living by selling curiosities. At length, through terror of Quilp, the old man and his grandchild stole away, and led a vagrant life.

Lochinvar (*lock'in-var*).—A young highlander, in the poem of *Marmion,* was much in love with a lady whose fate was decreed that she should marry a "laggard." Young Lochinvar persuaded the too-willing lassie to be his partner in a dance; and, while the guests were intent on their amusements, swung her into his saddle and made off with her before the bridegroom could recover from his amazement.

Locksley.—So Robin Hood is sometimes called, from the village in which he was born.

Locksley Hall.—A poem by Tennyson, in which the hero, the lord of Locksley Hall, having been jilted by his cousin Amy for a rich boor, pours forth his feelings in a flood of scorn and indignation. The poem is understood to have been occasioned by a similar incident in the poet's own life, but this has been questioned.

Lohengrin (*lō'hen-grin*).—The Knight of the Swan; the hero of a romance by Wolfram von Eschenbach, a German minnesinger of the thirteenth century, and also of a modern musical drama by Richard Wagner. He was the son of Parsival, and came to Brabant in a ship drawn by a white swan, which took him away again when his bride, disobeying his injunction, pressed him to discover his name and parentage.

Lorelei, or **Loreley** (*lō're-li*).—In German poetry and romance, a siren supposed to haunt the Lurlenberg rock on the Rhine, and lure sailors and fisherman to destruction. She is the subject of a beautiful ballad by Heine.

Lorna Doone.—A novel by R. D. Blackmore, published in 1869, the scene of which is laid in Exmoor. The Doones are a family of robbers and freebooters from which Lorna, otherwise Lady Lorna Dugal, is rescued by John Ridd, a young man. Ridd finally broke up the band, drove them from Doone valley, and married Lorna.

Love's Labor's Lost.—A comedy by Shakespeare. Ferdinand, king of Navarre, with three lords named Biron, Dumain, and Longaville, agree to spend three years in study, during which time no woman was to approach the court. The compact signed, all went well until the princess of France, attended by Rosaline, Maria, and Katharine, besought an interview respecting certain debts said to be due from the king of France to the king of Navarre. The four gentleman fell in love with the four ladies. The love of the king sought the princess, by right, Biron loved Rosaline, Longaville admired Maria, and Dumain adored Katharine. In order to carry their suits, the four gentlemen, disguised as Muscovites, presented themselves before the ladies; but the ladies, being warned of the masquerade,

disguised themselves also, so that the gentlemen in every case addressed the wrong lady. A mutual arrangement was made that the suits should be deferred for twelve months and a day; and if, at the expiration of that time, they remained of the same mind, the matter should be taken into serious consideration.

Lusiad (*lū'si-ad*), **The.**—A Portuguese poem by Luiz Camoëns, in 1572. *The Lusiad* celebrates the chief events in the history of Portugal, and is remarkable as the only modern epic poem which is pervaded by anything approaching the national and popular spirit of ancient epic poems. Bacchus was the guardian power of the Mohammedans, and Venus, or Divine Love, of the Lusians. The fleet first sailed to Mozambique, then to Melinda (in Africa), where the adventurers were hospitably received and provided with a pilot to conduct them to India. In the Indian Ocean, Bacchus tried to destroy the fleet; Venus, however, calmed the sea, and Gama arrived in India in safety. Having accomplished his object, he returned to Lisbon. Among the most famous passages are the tragical story of Inez de Castro, and the apparition of the giant Adamastor, who appears as the spirit of the storm to Vasco da Gama, when crossing the cape. The versification of *The Lusiad* is extremely charming.

M

Mab.—The queen of the fairies, famous in English literature if only on account of the exquisite description of her put into the mouth of Mercutio, in *Romeo and Juliet*, beginning "O, then, I see Queen Mab hath been with you."

Macbeth.—One of Shakespeare's most celebrated tragedies, whose chief characters are Macbeth, king of Scotland, and Lady Macbeth, his murderously ambitious wife. Urged by the latter he kills Duncan, the rightful king, and in turn is himself slain by Macduff. The tale of Macbeth and Banquo was borrowed from the legendary history of Scotland, but the interest of the play is not historical. It is a tragedy of human life, intensely real, the soul, with all its powers for good or evil, deliberately choosing evil. The three witches in the desert place, in thunder, lightning, storm, strike the keynote of evil suggestion. The awfulness of soul destruction is felt in Macbeth and Lady Macbeth as in no other of Shakespeare's dramas.

Macheath, Captain.—A highwayman who is the hero of Gay's *Beggar's Opera*.

Mac-Ivor (*mak-ē'vor*), **Fergus.**—*Waverley*, Scott, Fergus Mac-Ivor is a prominent character in the novel, and his sister, Flora Mac-Ivor, the heroine. They are of the family of a Scottish chieftain.

Macreons, The Island of.—*Pantagruel*, Rabelais. The title is given to Great Britain, derived from a Greek word meaning long-lived, "because no one is put to death there for his religious opinions." Rabelais says the island "is full of antique ruins and relics of popery and ancient superstitions."

Madasima, Queen.—An important character in the old romance called *Amadis de Gaul;* her constant attendant was Elisabat, a famous surgeon with whom she roamed in solitary retreats.

Madoc (*mad'ok*).—A poem by Southey, founded on one of the legends connected with the early history of America. Madoc, a Welsh prince of the twelfth century, is represented as making the discovery of the western world. His contests with the Mexicans form the subject.

Maidens' Castle.—An allegorical castle mentioned in Malory's *History of Prince Arthur*. It was taken from a duke by seven knights, and held by them till Sir Galahad expelled them. It was called The Maidens' Castle because these knights made a vow that every maiden who passed it should be made a captive.

Maid Marian.—A half mythical character, but the name is said to have been assumed by Matilda, daughter of Robert, Lord Fitzwalter, while Robin Hood remained in a state of outlawry. The name is considered the foundation of the word marionettes, from Maid Marian's connection with the morris dance, or May-day dance, at which she was said to appear.

Maid of Athens.—Made famous by Lord Byron's song of this title. Twenty-four years after this song was written an Englishman sought out "the Athenian maid," and found a beggar without a vestige of beauty.

Maid of Saragossa.—*Childe Harold*, Byron. A young Spanish woman distinguished for her heroism during the defense of Saragossa in 1808-1809. She first attracted notice by mounting a battery where her lover had fallen, and working a gun in his place.

Malade Imaginaire, Le (or, *The Imaginary Invalid*).—A comedy by Molière. Mons. Argan, who took seven mixtures and twelve lavements in one month instead of twelve mixtures with twenty lavements, as he had hitherto done. "No wonder," he says, "I am not so well." He fancies his wife loves him dearly, and that his daughter is undutiful, because she declines to marry a young medical prig instead of Cleante, whom she loves. His brother persuades "the malade" to counterfeit death, in order to test the sincerity of his wife and daughter. The wife rejoices greatly at his death, and proceeds to filch his property, when Argan starts up and puts an end to her pillage. Next comes the daughter's turn. When she hears of her father's death, she bewails him with great grief, says she has lost her best friend, and that she will devote her whole life in prayer for the repose of his soul. Argan is delighted, starts up in a frenzy of joy, declares she is a darling, and shall marry the man of her choice freely, and receive a father's blessing.

Malaprop (*mal'a-prop*), **Mrs.**—A character in Sheridan's *Rivals*, noted for her blundering use of words.

Malbecco.—*Faërie Queene*, Spenser. The husband of a young wife, Helinore, and himself a crabbed, jealous old fellow.

Malengrin.—A character in Spenser's *Faërie Queene*, who carried a net on his back "to catch fools with." The name has grown to mean the personification of guile or flattery.

Malepardus.—The castle of Master Reynard, the Fox, in the beast epic of *Reynard the Fox*.

Malvoisin.—*Ivanhoe*, Scott. One of the challenging knights at the tournament (Sir Philip de Malvoisin). Sir Albert de Malvoisin was a preceptor of the Knights Templar.

Mambrino (*mām-brē'nō*).—*Poems*, Ariosto, etc. A king of the Moors, who was the possessor of an enchanted golden helmet, which rendered the wearer invulnerable and which was the object of eager quest to the paladins of Charlemagne. This helmet was borne away by the knight Rinaldo. In *Don Quixote* we are told of a barber who was caught in a shower of rain, and who, to protect his hat, clapped his brazen basin on his head. Don Quixote insisted that this basin was the helmet of the Moorish king; and, taking possession of it, wore it as such.

Managarm.—*Prose Edda*. The largest and most formidable of the race of giants. He dwells in the Ironwood, Jamvid. Managarm will first fill himself with the blood of man, and then he will swallow up the moon. This giant symbolizes war, and the iron wood in which he dwells is the wood of spears.

Manfred.—A poem by Byron. Manfred sold himself to the prince of darkness, and received from him seven spirits to do his bidding. They were the spirits of "earth, ocean, air, night, mountains, winds, and the star of his own destiny." Wholly without human sympathies, the count dwelt in splendid solitude among the Alpine mountains. He loved Astarte, and was visited by her spirit after her death. In spirit form she told Manfred that he would die the following day; and, when asked if she loved him, she signed "Manfred," and vanished.

Manon l'Escaut (*mā-non' les-kō*).—A French novel by A. F. Prévost. Manon is the "fair mischief" of the story. Her charms seduce and ruin the chevalier des Grieux, who marries her. After marriage, the selfish mistress becomes converted into the faithful wife, who follows her husband into disgrace and banishment, and dies by his side in the wilds of America. The object of this novel, like that of *La Dame aux Camélias*, by Dumas *fils*, is to show how true hearted, how self-sacrificing, how attractive, a *fille de joie* may be.

Mantalini (*man-ta-lē'nē*).—*Nicholas Nickleby*, Dickens. The husband of madame; he is a man doll, noted for his white teeth, his oaths, and his gorgeous morning gown. This "exquisite" lives on his wife's earnings, and thinks he confers a favor on her by spending. Madame Mantalini is represented as a fashionable dressmaker near Cavendish Square, London.

Marble Faun, The.—A romance by Hawthorne, published in 1860. The English edition, published in the same year, is called *Transformation, or the Romance of Monte Beni*. See *Donatello*. The sole idea of the *Marble Faun* is to illustrate the intellectually and morally awakening power of a sudden impulsive sin, committed by a simple, joyous, instinctive, "natural" man. The whole group of characters is imagined solely with a view to the development of this idea.

Marcellus (*mär-sel'us*).—*Hamlet*, Shakespeare. An officer of Denmark, to whom the ghost of the murdered king appeared before it presented itself to Prince Hamlet.

Marchioness, The.—*Old Curiosity Shop*, Dickens. A half-starved maid-of-all-work, in the service of Sampson Brass and his sister Sally. She was so lonesome

and dull that it afforded her relief to peep at Mr. Swiveller even through the keyhole of his door. Mr. Swiveller called her the "marchioness," when she played cards with him, "because it seemed more real and pleasant" to play with a marchioness than with a domestic. While enjoying these games they made the well known "orange peel wine."

Mariana (*mă-rē-ä'nă*).—In Tennyson's poem *The Moated Grange*, a young damsel, who sits in the moated grange, looking out for her lover, who never comes. (2) In Shakespeare's *Measure for Measure* Mariana is a lovely and lovable lady, betrothed to Angelo, who, during the absence of Vincentio, the duke of Vienna, acted as his lord deputy. Her pleadings to the duke for Angelo are wholly unrivaled.

Martin's Summer, St.—Halcyon days; a time of prosperity; fine weather. Mentioned by Shakespeare in *Henry VI.*, etc.

Masora.—A critical work or canon, whereby is fixed and ascertained the reading of the text of the Hebrew version of the Bible.

Mauth Dog.—*Lay of the Last Minstrel*, Scott. A black specter spaniel that haunted the guard room of Peeltown in the Isle of Man. A drunken trooper entered the guard room while the dog was there, but lost his speech, and died within three days.

Mazeppa (*mă-zep'ä*).—A poem by Byron. Mazeppa was a Cossack of noble family who became a page in the court of the king of Poland, and while in this capacity intrigued with Theresia, the young wife of a count, who discovered the amour, and had the young page lashed to a wild horse, and turned adrift.

McFingal.—The hero of Trumbull's political poem of the same name; represented as a burly New England squire, enlisted on the side of the Tory part of the American revolution, and constantly engaged in controversy with Honorius, the champion of the Whigs.

Measure for Measure.—A comedy by Shakespeare. There was a law in Vienna that made it death for a man to live with a woman not his wife; but the law was so little enforced that the mothers of Vienna complained to the duke of its neglect. So the duke deputed Angelo to enforce it; and, assuming the dress of a friar, absented himself awhile, to watch the result. Scarcely was the duke gone, when Claudio was sentenced to death for violating the law. His sister Isabel went to intercede on his behalf, and Angelo told her he would spare her brother if she would become his Phryne. Isabel told her brother he must prepare to die, as the conditions proposed by Angelo were out of the question. The duke, disguised as a friar, heard the whole story, and persuaded Isabel to "assent in words," but to send Mariana (the divorced wife of Angelo) to take her place. This was done; but Angelo sent the provost to behead Claudio, a crime which "the friar" contrived to avert. Next day the duke returned to the city, and Isabel told her tale. Finally the duke married Isabel, Angelo took back his wife, and Claudio married Juliet.

Medea (*mē-dē'ä*).—A play by Euripides. The *Medea* came out in 431 B. C. along with the poet's *Philoctetes*, *Dictys*, and the satiric *Reapers* (the last was early lost). It was based upon a play of Neophron's, and only obtained the third prize, Euphorion being first, and Sophocles second. It may accordingly be regarded as a failure in its day—an opinion apparently confirmed by the faults (viz., Ægeus and the winged chariot) selected from it as specimens in Aristotle's *Poetica*. There is considerable evidence of there being a second edition of the play, and many of the variants, or so-called interpolations, seem to arise from both versions being preserved and confused. Nevertheless, there was no play of Euripides more praised and imitated.

Médecine Malgré Lui, Le (*mād-saN' mal-grā'lwē lu*), (or, *The Doctor in Spite of Himself*).—A comedy by Molière. The "enforced doctor" is Sganarelle, a fagot maker, who is called in by Géronte to cure his daughter of dumbness. Sganarelle soon perceives that the malady is assumed in order to prevent a hateful marriage, and introduces her lover as an apothecary. The dumb spirit is at once exorcized, and the lovers made happy with "pills matrimonial."

In 1733 Fielding produced a farce called *The Mock Doctor*, which was based on this comedy. The doctor he calls "Gregory," and Geronte "Sir Jasper." Lucinde, the dumb girl, he calls "Charlotta;" and Angelicizes her lover's name, Léandre, into "Leander."

Meg Merrilies (*mer'i-lēz*).—A prominent character in Scott's *Guy Mannering*, a half-crazy gypsy or sibyl.

Meistersingers (*mīs'ter-sing-ers*).—In Germany an association of master tradesmen, to revive the national minstrelsy, which had fallen into decay with the decline of the minnesingers or love minstrels (1350-1523). Their subjects were chiefly moral or religious, and constructed according to rigid rules.

Melissa (*me-lis'ä*).—*Orlando Furioso*, Ariosto. The prophetess who lived in Merlin's cave. Bradamante gave her the enchanted ring to take to Rogero; so, assuming the form of Atlantes, she not only delivered Rogero but disenchanted all the forms metamorphosed in the island where he was captive.

Melnotte, Claude.—*Lady of Lyons*, Bulwer. The son of a gardener in love with Pauline, "the Beauty of Lyons," but treated by her with contempt. Beauseant and Glavis, two other rejected suitors, conspired with him to humble her.

Merchant of Venice.—A comedy by Shakespeare. Antonio the merchant, signs a bond in order to borrow money from Shylock, a Jew, for Bassanio, the lover of Portia. If the loan was repaid within three months, only the principal would be required; if not, the Jew should be at liberty to claim a pound of flesh from Antonio's body. The ships of Antonio being delayed by contrary winds, the merchant was unable to meet his bill, and the Jew claimed the forfeiture. Portia, in the dress of a law doctor, conducted the defense, and saved Antonio by reminding the Jew that a pound of flesh gave him no drop of blood.

Merlin.—The name of an ancient Welsh prophet and enchanter. He is often alluded to by the older poets, especially Spenser, in his *Faërie Queene*, and also figures in Tennyson's *Idylls of the King*. In the *History of Prince Arthur* by Malory, Merlin is the prince of enchanters and of a supernatural origin. He is said to have built the Round Table and to have brought from Ireland the stones of Stonehenge.

Merlin's Cave.—In Dynevor, near Carmarthen, noted for its ghastly noises of rattling iron chains, groans, and strokes of hammers. The cause is said to be this: Merlin set his spirits to fabricate a brazen wall to encompass the city of Carmarthen, and, as he had to call on the Lady of the Lake, bade them not slacken their labor till he returned; but he never did return, for Vivian held him prisoner by her wiles.

Merry Wives of Windsor, The.—A comedy by Shakespeare. It is said that Queen Elizabeth was so pleased with the Falstaff of Henry IV. that she commanded Shakespeare to show how he conducted himself when in love. For the plot he was probably but little indebted to other writers. *The Two Lovers of Pisa* from Straparola, in Tarleton's *News Out of Purgatory*, and a story from *Il Pecorone* which suggests the hiding of Falstaff in the soiled linen, may possibly have suggested some of the incidents. John Dennis wrote a play, *The Comical Gallant, or the Amours of Sir John Falstaff*, in 1702, in which *The Merry Wives* may be recognized.

Messiah (*me-sī'ä*), **The.**—An epic poem in fifteen books, by F. G. Klopstock. The subject is the last days of Jesus, his crucifixion and resurrection.

Middlemarch: *A Study of Provincial Life.*—A novel, by George Eliot, published in 1872, and characterized by *The Quarterly Review* "as the most remarkable work of the ablest of living novelists, and, considered as a study of character, unique." The heroine is Dorothea Brooke, first married to Mr. Casaubon, afterward to Will Ladislaw. Among the other characters are Mr. Lydgate, Rosamond Vincy, Mary Garth, and Mrs. Cadwallader.

Midlothian, or **Mid-Lothian** (*mid-lō'THi-an*), **The Heart of.**—A tale by Scott, of the Porteous riot, in which the incidents of Effie and Jeanie Deans are of absorbing interest. Effie was seduced by Geordie Robertson (*alias* George Staunton), while in the service of Mrs. Saddletree. She murdered her infant, and was condemned to death; but her half sister Jeanie went to London, pleaded her cause before the queen, and obtained her pardon. Jeanie, on her return to Scotland, married Reuben Butler; and Geordie Robertson (then Sir George Staunton) married Effie. Sir George being shot by a gypsy boy, Effie (*i. e.*, Lady Staunton) retired to a convent on the continent.

Midsummer Night's Dream.—A comedy by Shakespeare. The author says there was a law in Athens that if a daughter refused to marry the husband selected for her by her father, she might be put to death. Ægeus, an Athenian, promised to give his daughter Hermia in marriage to Demetrius; but, as the lady loved Lysander, she refused to marry the man selected by her father, and fled from Athens with her lover. Demetrius went in pursuit of her, followed by Helena, who doted on him. All four came to a forest, and fell asleep. In their dreams a vision of fairies passed before them, and, on awaking, Demetrius resolved to forego Hermia, who disliked him, and to take to wife Helena, who sincerely loved him. When Ægeus was informed thereof, he readily agreed to give his daughter to Lysander, and the force of the law was not called into action (1592).

Mildendo.—*Gulliver's Travels*, Swift. The metropolis of Lilliput, the wall of which was two feet and a half in height, and at least eleven inches thick. The emperor's palace, called Belfaborac, was in the center of the city.

Miles Standish (or, *Courtship of Miles Standish*).—A poem by H. W. Longfellow. From this poem the robust figures of the Puritan captain in his haps and mishaps, and of John Alden and Priscilla, are now part of our national treasures.

Miller, Daisy.—Title and heroine of a story by Henry James. An American girl traveling in Europe, where her innocence, ignorance, and disregard of European customs and standards of propriety put her in compromising situations, and frequently expose her conduct to misconstruction.

Mill on the Floss.—A novel by George Eliot, published in 1860. There is a simplicity about *The Mill on the Floss* which reminds us of the classic tragedy. The vast power of nature over the career and fate of a family is figured forth in the river, beside which the child Maggie played, filling her mother's heart with gloomy and not unveracious presentiments, and down which she passed with Stephen in her hour of temptation, with Tom in her last moments; the whole strength of association and of the ties and instinct of blood breaking in at every critical point in the story, like the voice of a Greek chorus, full of traditionary warning and stern common sense, but speaking in the dialect of English rusticity, and by the mouths of Mr. Tulliver and his wife's relations.

Minna von Barnhelm (*min'ä fon bärn'helm*).—A comedy by Lessing, published in 1767. It is the first German national drama which deals with contemporary events.

Minnehaha (*min-e-hä'hä*).—*Hiawatha*, Henry W. Longfellow. The daughter of the arrow maker of Dacotah, and wife of Hiawatha. She was called Minnehaha from the waterfall of that name.

Minnesingers (*min'e-sing-erz*).—A name given to the German lyric poets of the middle ages, on account of love being the principal theme of their lays, the German word "minne" being used to denote a pure and faithful love.

Miranda.—*The Tempest*, Shakespeare. The daughter of Prospero, the exiled duke of Milan, and niece of Antonio, the usurping duke. She is brought up on a desert island, with Ariel, the fairy spirit, and Caliban, the monster, as her only companions.

Miriam.—A beautiful and mysterious woman in Hawthorne's romance *The Marble Faun*, for love of whom Donatello commits murder, thus becoming her partner in crime.

Misanthrope, Le (*mi-zăn-trop', lu*).—A comedy by Molière, produced in 1666. This play is an almost inexhaustible source of allusions, quotations, proverbial sayings, etc. Its principal interest lies in the development of various pairs of opposing characters in even their lightest shades. It is the ideal of classic comedy. Alceste, the impatient, but not cynical, hero. Célimène the coquette, Oronte the fop, Éliante the reasonable woman, Arsinoe the mischief maker, are all immortal types.

Misérables, Les [(*mi-zā-rabl', lâ*); or, *The Unfortunates.*]—A novel by Victor Hugo, in five parts: *Fantine, Cosette, Marius, L'Idylle Rue Plumet*, and *Jean Valjean.* It was published in 1862.

Morte d'Arthur (*môrt där'ther*).—(1) Compilation of Arthurian tales, called on the title page *The History of Prince Arthur*, compiled from the French by Sir Thomas Malory, and printed by William Caxton in 1470. It is divided into three parts. The first part contains the birth of King Arthur, the establishment of the Round Table, the romance of Balin and Balan, and the beautiful allegory of Gareth and Linet. The second part is mainly the romance of Sir Tristram. The third part is the romance of Sir Launcelot, the quest of the holy grail, and the death of Arthur, Guinevere, Tristram, Lamorake, and Launcelot.

(2) An idyll by Tennyson, called *The Passing of Arthur*, in the *Idylls of the King.* The poet supposes Arthur (wounded in the great battle of the west) to be borne off the field by Sir Bedivere. The wounded monarch directed Sir Bedivere to cast Excalibur into the mere. Sir Bedivere then carried the dying king to a barge, in which were three queens, who conveyed him to the island valley of Avilion.

Mualox.—*The Fair God*, Lew Wallace. The old paba or prophet who assured Nenetzin that she was to be the future queen in her father's palace.

Much Ado About Nothing.—A comedy by Shakespeare. It was first printed in 1600. The play was known as *Benedict and Bettris* in 1613, and is probably the same as *Love's Labor's Won.* The story of Hero is taken with some variations from one of Bandello's tales, which probably was borrowed from the story of Geneura and Ariodantes in the *Orlando Furioso* of Ariosto. This part of the play, however, is subordinated by Shakespeare to the loves of Benedict and Beatrice.

Mucklebacket.—*The Antiquary*, Scott. Name of a conspicuous family, consisting of Saunders Mucklebacket, the old fisherman of Musselcrag; Old Elspeth, mother of Saunders; Maggie, wife of Saunders; Steenie, the eldest son, who was drowned; Little Jennie, Saunders' child.

Mumblecrust, Madge.—A character in Edall's *Ralph Roister Doister*, whose name was subsequently employed in Dekker's *Satiro-Mastix*, and the comedy of *Patient Grissel.* Madge is mentioned in the MS. comedy of *Misogonus.*

Münchausen (*münch'hou-zen*), **The Baron.**—A hero of most marvelous adventures, and the fictitious author of a book of travels filled with most extravagant tales. The name is said to refer to Hieronymus Karl Friedrich von Münchausen, a German officer in the Russian army, noted for his marvelous stories.

Mutual Friend, Our.—A novel by Charles Dickens. The "mutual friend" is Mr. Boffin, the golden dustman, who was the mutual friend of John Harmon and of Bella Wilfer. The tale is this: John Harmon was supposed to have been murdered by Julius Handford; but it was Ratford, who was murdered by Rogue Riderhood, and the mistake arose from a resemblance between the two persons. By his father's will, John Harmon was to marry Bella Wilfer; but John Harmon knew not the person destined by his father for his wife, and made up his mind to dislike her. After his supposed murder, he assumed the name of John Rokesmith, and became the secretary of Mr. Boffin, "the golden dustman," residuary legatee of old John Harmon, by which he became possessor of one hundred thousand dollars. Boffin knew Rokesmith, but concealed his knowledge for a time. At Boffin's house John Harmon (as Rokesmith) met Bella Wilfer, and fell in love with her. Mr. Boffin, in order to test Bella's love, pretended to be angry with Rokesmith for presuming to love Bella; and, as Bella married him, he cast them both off "for a time," to live on John's earnings. A babe was born, and then the husband took the young mother to a beautiful house, and told her he was John Harmon, that the house was their house, that he was the possessor of five hundred thousand dollars through the disinterested conduct of their "mutual friend," Mr. Boffin, and the young couple live happily with Mr. and Mrs. Boffin, in wealth and luxury.

My Novel.—A work of fiction by Edward, Lord Lytton, published in 1853. It is described as the "great work which marks the culminating point in Lord Lytton's genius, the work to which, with a rare estimate of his own powers, he has given the singularly appropriate title of *My Novel.* . . . If we except one or two melodramatic scenes, it is throughout an admirable work. . . . The plot is complex, but it is unfolded with marvelous directness and ingenuity, and, notwithstanding the digressions, the interest never for a moment flags." Among the characters are Squire Hazeldean, Mr. Dale, Dick Avenel, Leonard Fairfield, and Harley L'Estrange.

N

Nathan the Wise [*Nathan der Wise* (*nä'tän der vī'ze*).]—A drama by G. E. Lessing, so called from the name of its principal character. Its tendency is toward religious tolerance, especially in the episode of the three rings, which was taken from Boccaccio. Nathan is a persecuted but noble Jew, an ideal character resembling Moses Mendelssohn.

Natty Bumppo.—Called "Leather-Stocking." He appears in five of Cooper's novels: (1) *The Deerslayer;* (2) *The Pathfinder;* (3) As "Hawk-eye" in *The Last of the Mohicans;* (4) "Natty Bumppo" in *The Pioneers;* and (5) as the "Trapper" in *The Prairie*, in which he dies.

Neæra (*nē-ē'rä*).—The name of a girl mentioned by the Latin poets Horace, Vergil, and Tibullus; sometimes also introduced into modern pastoral poetry as the name of a mistress or sweetheart.

Nepenthe.—A care-dispelling drug, which Polydamna, wife of Thonis, king of Egypt, gave to Helen. A drink containing this drug "changed grief to mirth, melancholy to joyfulness, and hatred to love." The water of Ardenne had the opposite effects. Homer mentions this drug nepenthe in his *Odyssey.* It is also mentioned in Poe's *Raven.*

New Atlantis, The.—An imaginary island in the middle of the Atlantic. Bacon, in his allegorical fiction, so called, supposes himself wrecked on this island,

where he finds an association for the cultivation of natural science and the promotion of arts. Called the "New" Atlantis to distinguish it from Plato's Atlantis, an imaginary island of fabulous charms.

Newcomes, The.—*Memoirs of a Most Respectable Family*, by William Makepeace Thackeray. The hero is Clive Newcome, a young artist, son of Colonel Newcome, and cousin of Ethel Newcome, whom he marries after the death of his first wife, Rosa Mackenzie. Among the other characters are Comte de Florac, Charles Honeyman, "J. J.," Fred Bayham, Lady Kew, Jack Belsize, Dr. Goodenough, and others.

Colonel Newcome, is "the finest portrait," says Hannay, "that has been added to the gallery of English fiction since Sir Walter's time. The pathos, at once manly and delicate, with which his ruin and death are treated, places Thackeray in a high rank in poetic sentiment."

Nibelungenlied (*nē'be-loong-en-lēd*).—An historic poem, generally called the German *Iliad*. It is the only great national epic that European writers have produced since antiquity, and belongs to every country that has been peopled by Germanic tribes, as it includes the hero traditions of the Franks, the Burgundians and the Goths, with memorials of the ancient myths carried with them from Asia. The poem is divided into two parts, and thirty-two lieds, or cantos. The first part ends with the death of Siegfried, and the second part with the death of Kriemhild. The death of Siegfried and the revenge of Kriemhild have been celebrated in popular songs dating back to the lyric chants now a thousand years old. These are the foundation of the great poem.

Nicholas Nickleby.—A novel by Dickens. The mother of the hero, Nicholas, is a widow fond of talking and of telling long stories with no connection. She imagined her neighbor, a mildly insane man, was in love with her because he tossed cabbages and other articles over the garden wall. She had a habit of introducing in conversation topics wholly irrelevant to the subject under consideration, and of always declaring, when anything unanticipated occurred, that she had expected it all along, and had prophesied to that precise effect on divers (unknown) occasions. Nicholas Nickleby has to make his own way in the world. He first goes as usher to Mr. Squeers, schoolmaster at Dotheboys Hall; but leaves in disgust with the tyranny of Squeers and his wife, especially to a poor boy named Smike. Smike runs away from the school to follow Nicholas, and remains his humble follower till death. At Portsmouth, Nicholas joins the theatrical company of Mr. Crummles, but leaves the profession for other adventures. He falls in with the Brothers Cheeryble, who make him their clerk; and in this post he rises to become a merchant, and finally marries Madeline Bray.

Nightingale, Ode to a.—Poem by John Keats, which "was written," says Leigh Hunt, "in a house at the foot of Highgate Hill, on the border of the fields looking toward Hampstead. The poet had then his mortal illness upon him, and knew it; never was the voice of death sweeter."

Thou wast not born for death, immortal Bird!
No hungry generations tread thee down;
The voice I hear this passing night was heard
In ancient days by emperor and clown;
Perhaps the selfsame song that found a path
Through the sad heart of Ruth, when, sick for home,
She stood in tears amid the alien corn;
The same that ofttimes hath
Charm'd magic casements, opening on the foam
Of perilous seas, in faëry lands forlorn.

Notre Dame de Paris.—A prose romance by Victor Hugo, published in 1831. The scene is laid in Paris at the end of the reign of Louis XI. It is a vigorous but somber picture of mediæval manners.

Nourmahal (*nōr-ma-häl'*).—*Lalla Rookh*, Moore. "Light of the Harem." She was for a season estranged from the sultan, till he gave a grand banquet, at which she appeared in disguise as a lute-player and singer. The sultan was so enchanted with her performance that he exclaimed, "If Nourmahal had so played and sung, I could forgive her all;" whereupon the sultana threw off her mask.

Nucta.—*Paradise and the Peri*, Moore. The name given to the miraculous drop which falls from heaven, in Egypt, on St. John's day, and is supposed to stop the plague.

Nun of Nidaros.—*Tales of a Wayside Inn*, Longfellow. The abbess of the Drontheim convent, who heard the voice of St. John while she was kneeling at her midnight devotions.

Nut-Brown Maid.—*Reliques*, Percy. The maid who was wooed by the "banished man." The "banished man" described to her the hardships she would have to undergo if she married him; but finding that she accounted these hardships as nothing compared with his love, he revealed himself to be an earl's son, with large hereditary estates in Westmoreland, and married her.

O

Obermann (*ō-ber-män'*).—The impersonation of high moral worth without talent, and the tortures endured by the consciousness of this defect. This name was given to the hero and imaginary author of a work of the same name by Etienne Pivert de Senancourt, a French writer.

Oberon (*ō'be-ron*).—King of the fairies, whose wife was Titania. Shakespeare introduces both Oberon and Titania in his *Midsummer Night's Dream*. He and Titania, his queen, are fabled to have lived in India, and to have crossed the seas to northern Europe to dance by the light of the moon.

Oberon the Fay.—A humpty dwarf only three feet high, but of angelic face, lord and king of Mommur.

Odyssey (*od'i-si*).—Homer's epic poem recording the adventures of Odysseus (Ulysses) in his voyage home from Troy. The poem opens in the island of Calypso, with a complaint against Neptune and Calypso for preventing the return of Odysseus to Ithaca. Telemachos, the son of Odysseus, starts in search of his father, accompanied by Pallas in the guise of Mentor. He goes to Pylos to consult old Nestor, and is sent by him to Sparta, where he is told by Menelaus that Odysseus is detained in the island of Calypso. In the meantime, Odysseus leaves the island, and, being shipwrecked, is cast on the shore of Phæacia. After twenty years' absence Odysseus returns to his home. Penelope is tormented by suitors. To excuse herself, Penelope tells her suitors he only shall be her husband who can bend Odysseus' bow. None can do so but the stranger, who bends it with ease. Odysseus is recognized by his wife, and the false suitors are all slain, and peace is restored to Ithaca.

Œdipus (*ed'i-pus*) **Coloneus** [(*kō-lō-nē'us*); or, *Œdipus at Colonus* (*kō-lō'nus*)].—A tragedy of Sophocles, which was not exhibited till four years after his death, and was said to be the last he wrote. In it Œdipus, driven from Thebes by Creon, with his daughters, Antigone and Ismene, seeks asylum with Theseus at Athens, and there obtains pardon from the gods, and peace.

Œdipus Tyrannus (*ti-ran'us*).—A tragedy by Sophocles, of uncertain date, "placed by the scholiasts, and by most modern critics, at the very summit of Greek tragic art."

Ogier (*ō-zhyā'*) **the Dane.**—One of the paladins of the Charlemagne epoch. Also made the hero of an ancient French romance, and the subject of a ballad whose story is probably a contribution from the stores of Norman tradition, Holger, or Olger, Danske, being the national hero of Denmark. He figures in Ariosto's *Orlando Furioso*.

O'Groat.—A name often alluded to in early English parables or sayings coming from the legend of *John O'Groat's House*. This ancient building was supposed to stand on the most northerly point in Great Britain. John of Groat and his brothers were originally from Holland. According to tradition, the house was of an octagonal shape, being one room with eight windows and eight doors, to admit eight members of the family, the heads of eight different branches of it, to prevent their quarrels for precedence at table, which, on a previous occasion, had well-nigh proved fatal.

Oldbuck, Jonathan.—*Antiquary*, Scott. The character whose whimsies gave name to the novel. He is represented as devoted to the study and accumulation of old coins, medals, and relics. He is irritable, sarcastic, and cynical from an early disappointment in love, but full of humor and a faithful friend.

Old Curiosity Shop, The.—A tale by Charles Dickens. An old man, having run through his fortune, opened a curiosity shop in order to earn a living and brought up a granddaughter, named Nell [Trent], fourteen years of age. The child was the darling of the old man, but, deluding himself with the hope of making a fortune by gaming, he lost everything, and went forth, with the child, a beggar. Their wanderings and adventures are recounted till they reach a quiet country village, where the old clergyman gives them a cottage to live in. Here Nell soon dies, and the grandfather is found dead upon her grave. The main character, next to Nell, is that of a lad named Kit [Nubbles], employed in the curiosity shop, who adored Nell as "an angel." This boy gets in the service of Mr. Garland, a genial, benevolent, well-to-do man, in the suburbs of London; but Quilp hates the lad, and induces Brass, a solicitor of Bevis Marks, to put a five pound banknote in the boy's

hat, and then accuse him of theft. Kit is tried, and condemned to transportation; but, the villainy being exposed by a girl-of-all-work nicknamed "The Marchioness," Kit is liberated and restored to his place, and Quilp drowns himself.

Old Man of the Sea.—In the *Arabian Nights*, a monster encountered by Sindbad the sailor in his fifth voyage. After carrying him upon his shoulders a long time, Sindbad at last succeeds in intoxicating him, and effects his escape. The *Old Man of the Sea* was also made the title of a humorous and well-known poem by O. W. Holmes.

Old Mortality, the best of Scott's historical novels. Morton is the best of his young heroes, and serves as an excellent foil to the fanatical and gloomy Burley. The two classes of actors, *viz.*, the brave and dissolute cavaliers, and the resolute oppressed covenanters, are drawn in bold relief. The most striking incidents are the terrible encounter with Burley in his rocky fastness; the dejection and anxiety of Morton on his return from Holland; and the rural comfort of Cuddie Headrigg's cottage on the banks of the Clyde, with its thin blue smoke among the trees, "showing that the evening meal was being made ready." Old Mortality is an itinerant antiquary, whose craze is to clean the moss from gravestones, and keep their letters and effigies in good condition.

Old Red Sandstone.—One of the most noted of Hugh Miller's famous writings on geological subjects. It revealed his discovery of fossils in a formation which, up to that time, had been deemed almost destitute of them.

Oliver.—*As You Like It*, Shakespeare. Son and heir of Sir Rowland de Bois, who hated his youngest brother, Orlando, and whom he planned to murder by indirect methods. Orlando, finding it impossible to live in his brother's house, fled to the forest of Arden, where he joined the society of the banished duke. Oliver pursued him, and as he slept in the forest a snake and a lioness lurked near to make him their prey. Orlando chanced to be passing, slew the two monsters, and then found that the sleeper was his brother Oliver. Oliver's feelings underwent a change, and he loved his brother as much as he had before hated him. In the forest the two brothers met Rosalind and Celia. The former, who was the daughter of the banished duke, married Orlando; and the latter, who was the daughter of Frederick, the usurping duke, married Oliver.

Oliver Twist.—A novel by Charles Dickens. Thackeray, writing of this novel, in the character of "Ikey Solomons," says: "The power of the writer is so amazing that the reader at once becomes his captive, and must follow him whithersoever he leads: and to what are we led? Breathless to watch all the crimes of Fagin, tenderly to deplore the errors of Nancy, to have for Bill Sikes a kind of pity and admiration, and an absolute love for the society of the Dodger. All these heroes stepped from the novel on to the stage; and the whole London public, from peers to chimney sweeps, were interested about a set of ruffians whose occupations are thievery, murder, and prostitution." A remarkable feature of the work, and one which, on its publication, brought considerable odium on the writer, was its unsparing exposure of the poor-law and the workhouse system, which led to its representation on the stage being forbidden for a time.

Olivia.—*Twelfth Night*, Shakespeare. A rich countess, whose love was sought by Orsino, duke of Illyria; but, having lost her brother, Olivia lived for a time in entire seclusion, and in no wise reciprocated the duke's love. Olivia fell in love with Viola, who was dressed as the duke's page, and sent her a ring. Mistaking Sebastian (Viola's brother) for Viola, she married him out of hand.

Ophelia (*ō-fē'liă*).—*Hamlet*, Shakespeare. Daughter of Polonius, the chamberlain. Hamlet fell in love with her, but, after his interview with the Ghost, finds that his plans must lead away from her. During his real or assumed madness, he treats her with undeserved and angry rudeness, and afterward, in a fit of inconsiderate rashness, kills her father, the old Polonius. The terrible shock given to her mind by these events completely shatters her intellect, and leads to her accidental death by drowning.

Organon (*ôr'ga-non*).—The name given to the first work on logic by Aristotle. He is said to have created the science of logic. The *Organon* has been enlarged and recast by some modern authors, especially by Mr. John Stuart Mill in his *System of Logic*, into a structure commensurate with the vast increase of knowledge and extension of positive method belonging to the present day.

Origin of Species, The.—A work by Charles Robert Darwin, in which he put forward his theory of "natural selection." It was published in 1859, and by many is regarded as the most important scientific work of the nineteenth century.

Orlando Furioso (*or-lăn'dō fō-rē-ō'sō*).—An epic poem in forty-six cantos, by Ariosto, which occupied his leisure for eleven years, and was published in 1516. This poem, which celebrates the semi-mythical achievements of the paladins of Charlemagne in the wars between the Christians and the Moors, became immediately popular, and has since been translated into all European languages, and passed through innumerable editions.

Ormulum (*ôr'mū-lum*).—The *Ormulum* is a collection of metrical homilies, one for each day of the year; but the single existing copy gives the homilies for thirty-two days only. There are very few French words in the poem, but Scandinavian words and constructions abound. The writer, Orm, or Ormin, belonged to the east of England, and he and his brother Walter were Augustinian monks. He makes no use of rhyme, but his verses are smooth and regular.

Osbaldistone (*os-bâl'dis-ton*).—*Rob Roy*, Scott. A family name in the story which tells of nine of the members: (1) the London merchant and Sir Hildebrand, the heads of two families; (2) the son of the merchant is Francis; (3) the offspring of the brother are Percival, the sot; Thorncliffe, the bully; John, the gamekeeper: Richard, the horse-jockey; Wilfred, the fool; and Rashleigh, the scholar, by far the worst of all. This last worthy is slain by Rob Roy, and dies cursing his cousin Frank, whom he had injured.

O'Shanter.—See *Tam O'Shanter*.

Osman (*os-măn'*).—Sultan of the East, conqueror of the Christians, a magnanimous man. He loved Yara, a young Christian captive. This forms the subject of a once famous ballad.

Osrick (*oz'rik*).—A court fop in Shakespeare's *Hamlet*. He is made umpire by Claudius in the combat between Hamlet and Laertes.

Osseo.—*Hiawatha*, Longfellow. Son of the Evening Star. When broken with age, he married Oweenee, one of ten daughters of a northland hunter. She loved him in spite of his ugliness and decrepitude, because "all was beautiful within him." As he was walking with his nine sisters-in-law and their husbands, he leaped into the hollow of an oak tree and came out strong and handsome; but Oweenee at the same moment was changed into a weak old woman. But the love of Osseo was not weakened. The nine brothers and sisters-in-law were transformed into birds. Oweenee, recovering her beauty, had a son, whose delight was to shoot the birds that mocked his father and mother. An Algonquin legend gave the foundation of the story.

Othello (*ō-thel'ō*).—A tragedy by Shakespeare. The chief character is a Moor of Venice, who marries Desdemona, the daughter of a Venetian senator, and is led by his ensign, Iago, a consummate villain, to distrust her fidelity and virtue. Iago hated the Moor both because Cassio, a Florentine, was preferred to the lieutenancy instead of himself, and also from a suspicion that the Moor had tampered with his wife; but he concealed his hatred so well that Othello wholly trusted him. Iago persuaded Othello that Desdemona intrigued with Cassio, and urged him on till he murdered his bride.

Outre-Mer (*ōōtr-mèr*).—*A Pilgrimage Beyond the Sea.*—A series of prose tales and sketches by Henry Wadsworth Longfellow, published in 1835. "The Pays d'Outre-Mer," says the writer, "is a name by which the pilgrims and crusaders of old designated the Holy Land. I, too, in a certain sense, have been a pilgrim of Outre-Mer; for to my youthful imagination the Old World was a kind of Holy Land, lying afar off beyond the blue horizon of the ocean. In this, my pilgrimage, I have traversed France from Normandy to Navarre; smoked my pipe in a Flemish inn; floated through Holland in a Trekschuit; trimmed my midnight lamp in a German university; wandered and mused amid the classic scenes of Italy; and listened to the gay guitar and merry castanet on the borders of the blue Guadalquivir."

P

Pacolet (*pak'ō-let*).—In *Valentine and Orson*, an old romance, a character who owned an enchanted steed, often alluded to by early writers. The name of Pacolet was borrowed by Steele for his familiar spirit in the *Tatler*. The French have a proverb, "It is the horse of Pacolet;" that is, it is one that goes very fast.

Page.—*Merry Wives of Windsor*, Shakespeare. Name of a family of Windsor, conspicuous in the play. When Sir John Falstaff made love to Mrs. Page, Page himself assumed the name of Brook. Sir John told the supposed Brook his whole "course of wooing."

Page, Anne.—Daughter of the above, in love with Fenton. Slender calls her "the sweet Anne Page."

Page, Mrs.—Wife of Mr. Page, of Windsor. When Sir John Falstaff made love to her, she joined with Mrs. Ford to dupe him and punish him.

Palamon.—(1) A character in *The Knight's Tale* in Chaucer's *Canterbury Tales*, in love with Emilia, who is also beloved by Palamon's friend, Arcite. (2) In Falconer's poem of *The Shipwreck*, is in love with the daughter of Albert, the commander of the vessel in which he sails. (3) In Thomson's poem of *Autumn* in *The Seasons*, is a young man, "the pride of swains," in love with Lavinia. He is a poetical representation of Boaz, while Lavinia is intended for Ruth.

Pangloss (*pan'glos*), **Doctor.**—(1) A poor pedant, in Colman the Younger's comedy of the *Heir at Law*, who has been created an *Artium Societatis Socius* (*A. S. S.*). He is remarkable for the aptness, if triteness, of his quotations. (2) An optimist philosopher in Voltaire's *Candide*.

Pantagruelian (*pan-tag'rō-el-an*) **Law Case.**—*Pantagruel*, Rabelais. This case, having nonplused all the judges in Paris, was referred to Lord Pantagruel for decision. After much "statement" the bench declared, "We have not understood one single circumstances of the defense." Then Pantagruel gave sentence, but his judgment was as unintelligible as the case itself. So, as no one understood a single sentence of the whole affair, all were perfectly satisfied.

Paracelsus (*par-a-sel'sus*).—A dramatic poem by Robert Browning, published in 1835. It is a work of singular beauty, and is replete with lofty and solemn thoughts on the fate of genius and the chance and change of life. The Paracelsus of the poem is a very different person from the Paracelsus of history—the brilliant and daring quack who professed to have discovered the philosopher's stone, but who, by the introduction of opium among the remedies of the *Pharmacopœia*, in some wise made amends for his absurd extravagance.

Paradise and the Peri.—The second tale in Moore's poetical romance of *Lalla Rookh*. The Peri laments her expulsion from heaven, and is told that she will be readmitted if she will bring to the gate of heaven the "gift most dear to the Almighty." After several failures the Peri offered the "Repentant Tear," and the gates flew open to receive the gift.

Paradise Lost.—An epic poem by Milton. The poem opens with the awaking of the rebel angels in hell after their fall from heaven, the consultation of their chiefs how best to carry on the war with God, and the resolve of Satan to go forth and tempt newly created man to fall. Satan reaches Eden, and finds Adam and Eve in their innocence. This is told in the first four books. The next four books contain the Archangel Raphael's story of the war in heaven, the fall of Satan, and the creation of the world. The last four books describe the temptation and the fall of man, and tell of the redemption of man by Christ, and the expulsion from Paradise.

Paradise Regained.—An epic by Milton on the redemption of man. In this poem the author tells of the journey of Christ into the wilderness after his baptism, and its four books describe the temptation of Christ by Satan.

Parallel Lives of Greeks and Romans.—A celebrated biographical work by Plutarch, consisting of forty-six comparisons. In spite of all exceptions on the score of inaccuracy, want of information, or prejudice, *Plutarch's Lives* must remain one of the most valuable relics of Greek literature, not only because they stand in the place of many volumes of lost history, but also because they are written with a graphic and dramatic vivacity such as we find in few biographies, ancient or modern; because they are replete with reflections which, if not profound, are always moderate and sensible; and because the author's aim throughout is to enforce the highest standard of morality of which a heathen was capable. As one of his most enthusiastic admirers has said, "He stands before us as the legate, the ambassador, and the orator on behalf of those institutions whereby the old-time men were rendered wise and virtuous."

Partington (*pär'ting-ton*), **Mrs.**—An imaginary old lady whose laughable sayings have been recorded by an American humorist, B. P. Shillaber.

Paul and Virginia.—A popular romance by Bernardin de St. Pierre. According to a tradition, or version, Paul and Virginia are brought up in the belief that they are brother and sister. Don Antonio is sent to bring her to Spain, and make her his bride. She is taken by force on board ship, but scarcely has the ship started, when a hurricane dashes it on the rocks and it is wrecked. Alhambra, a runaway slave, whom Paul and Virginia had befriended, rescues Virginia, who is brought to shore and married to Paul. Antonio is drowned.

Pauline.—The Lady of Lyons in Bulwer-Lytton play's of this name. She was married to Claude Melnotte, a gardener's son, who pretended to be a count.

Paul Pry.—*Paul Pry*, John Poole. An idle, inquisitive, meddlesome fellow, who has no occupation of his own, and is forever poking his nose into other people's affairs. He always comes in with the apology "I hope I don't intrude."

Peau de Chagrin (*pō du shā-grin*), "*The Ass' Skin.*"—A story by Balzac. The hero becomes possessed of a magical wild ass' skin, which yields him the means of gratifying every wish; but for every wish thus gratified the skin shrank somewhat, and at last vanished, having been wished entirely away. Life is a *peau d'âne*, for every vital act diminishes its force, and when all its force is gone, life is spent.

Peeping Tom of Coventry.—A tailor of Coventry, the only soul in the town mean enough to peep at the Lady Godiva as she rode naked through the streets to relieve the people from oppression.

Peggotty (*peg'o-ti*), **Clara.**—The nurse of David Copperfield in Dickens' novel of this name. Being very plump, whenever she makes any exertion some of the buttons on the back of her dress fly off.

Peggotty, Dan'l.—Brother of David Copperfield's nurse. Dan'l was a Yarmouth fisherman. His nephew, Ham Peggotty, and his brother-in-law's child, "little Em'ly," lived with him.

Peggotty, Em'ly.—She was engaged to Ham Peggotty; but being fascinated with Steerforth she eloped. She was afterward reclaimed, and emigrated to Australia.

Peggotty, Ham.—Represented as the very beau ideal of an uneducated, simple-minded, honest, and warm-hearted fisherman. He was drowned in his attempt to rescue Steerforth from the sea.

Pendennis (*pen-den'is*), **The History of.**—By William Makepeace Thackeray. The hero, Arthur Pendennis, reappears in the author's *Adventures of Philip*, and is represented as telling the story of *The Newcomes*.

Pendennis.—Name of the hero of a novel by Thackeray, published in 1849 and 1850, the immediate successor of *Vanity Fair*. Literary life is described in the history of Pen, a hero of no very great worth.

Pendennis, Laura.—Sister of Arthur, considered one of the best of Thackeray's characters.

Pendennis, Major.—A tuft-hunter, who fawns on his patrons for the sake of wedging himself into their society.

Penseroso (*pen-se-rō'sō*), **Il.**—A poem by John Milton, written as a companion to *L'Allegro*. The latter is composed in the character of a cheerful, the former in that of a melancholy, man, and the whole tone of each poem is regulated accordingly. The one begins with the dawn, the other with evening. The one opens with the lark, the other with the nightingale, and so on.

Pepys, (*pēps*, or *pips*, or *pep'is*) **Diary.**—A book by Samuel Pepys, written in shorthand, and deciphered and published in 1825. It extends over the nine years from 1660 to 1669, and is the gossipy chronicle of that gay and profligate time. We have no other book which gives so lifelike a picture of that extraordinary state of society.

Peregrine Pickle (*per'e-grin pik'l*).—The title of a novel by Smollett. Peregrine Pickle is a savage, ungrateful spendthrift, fond of practical jokes, and suffering with evil temper the misfortunes brought on himself by his own willfulness.

Peter Bell.—A tale in verse, by Wordsworth. A wandering tinker, subject of Wordsworth's poem, whose hard heart was touched by the fidelity of an ass to its dead master. Shelley wrote a burlesque of this poem, entitled *Peter Bell the Third*, intended to ridicule the ludicrous puerility of language and sentiment which Wordsworth often affected. This burlesque was given the name of the *Third* because it followed a parody already published as *Peter the Second*.

Petruchio (*pe-trō'chō*, or *ki-ō*).—A gentleman of Verona in Shakespeare's *Taming of the Shrew*. A very honest' fellow, who hardly speaks a word of truth, and succeeds in all his tricks. He acts his assumed character to the life, with untired animal spirits, and without a particle of ill-humor.

Phædo (*fē'dō*), or **Phædon** (*fē'don*).—An ancient and well known work by Plato, in which the doctrine of the immortality of the soul is most fully set forth. It is in the form of a dialogue, which combines, with the abstract philosophical discussion, a graphic narrative of the last hours of Socrates, which, for pathos and dignity, is unsurpassed.

Phèdre (*fā'dr*).—A tragedy by Racine, produced January 1, 1677. It was founded on the story of Phædra, daughter of Minos, king of Crete, and wife of Theseus.

She conceived a criminal love for Hippolytus, her stepson, and, being repulsed by him, accused him to her husband of attempting to dishonor her. Hippolytus was put to death, and Phædra, wrung with remorse, strangled herself. *Phèdre* was the great part of Mdlle. Rachel; she first appeared in this character in 1838. It is unquestionably the most remarkable of Racine's regular tragedies. By it the style must stand or fall, and a reader need hardly go farther to appreciate it. For excellence of construction, artful beauty of verse, skillful use of the limited means of appeal at the command of the dramatist, no play can surpass *Phèdre*.

Philip.—*The Madness of Philip*, Josephine Daskam. A representation of the unregenerate child—"the child of strong native impulses who has not yet yielded to the shaping force of education; the child, therefore, of originality, of vivacity, of humor, and of fascinating power of invention in the field of mischief.

Philippics (*fi-lip'iks*), **The.**—A group of nine orations of Demosthenes, directed against Philip of Macedon. The real adversary in all these famous speeches is not so much the king of Macedon as the sloth and supineness of the Athenians, and the influence of the peace party, whether honest or bribed by Philip. They are the first Philippic, urging the sending of a military force to Thrace, delivered 351 B. C.; three orations in behalf of the city of Olynthus (destroyed by Philip), delivered in 349-348; the oration *On the Peace*, 346; the second Philippic, 344; the oration *On the Embassy*, 344; the speech *On the Chersonese*, 341; and the third Philippic, 341.

The name is also given to a series of fourteen orations of Cicero against Mark Antony, delivered 44-43 B. C.

Philtra.—*Faërie Queene*, Spenser. A lady of large fortune, betrothed to Bracidas; but, seeing the fortune of Amidas daily increasing, and that of Bracidas getting smaller, she attached herself to the more prosperous younger brother.

Phineas (*fin'e-as*).—*Uncle Tom's Cabin*, Mrs. Stowe. The quaker, an "underground railroad" man who helped the slave family of George and Eliza to reach Canada, after Eliza had crossed the river on cakes of floating ice.

Phyllis (*fil'is*).—In Vergil's *Eclogues*, the name of a rustic maiden. This name, also written Phillis, has been in common use as meaning any unsophisticated country girl.

Pickwick (*pik'wik*), **Mr. Samuel.**—The hero of the *Pickwick Papers*, by Charles Dickens. He is a simple-minded, benevolent old gentleman, who wears spectacles and short black gaiters. He founds a club, and travels with its members over England, each member being under his guardianship. They meet many laughable adventures.

Pied Piper of Hameln (*hä'meln*).—Old German legend. Robert Browning, in his poem entitled *The Pied Piper*, has given a metrical version. The legend recounts how a certain musician came into the town of Hameln, in the country of Brunswick, and offered, for a sum of money, to rid the town of the rats by which it was infested. Having executed his task, and the promised reward having been withheld, he in revenge blew again his pipe, and by its tones drew the children of the town to a cavern in the side of a hill, which, upon their entrance, closed and shut them in forever.

Piers Plowman (*pērs plou'man*).—A satirical poem of the fourteenth century. The hero falls asleep, like John Bunyan, on the Malvern hills, and has different visions, which he describes, and in which he exposes the corruptions of society, the dissoluteness of the clergy, and the allurements to sin. The author is supposed to be Robert or William Langland. No other writings so faithfully reflect the popular feeling during the great social and religious movements of that century as the bitterly satirical poem, *The Vision of Piers Plowman*. In its allegory, the discontent of the commons with the course of affairs in church and state found a voice.

Pietro.—*The Ring and the Book*, Browning. The professed father of Pompilia, criminally assumed as his child to prevent certain property from passing to an heir not his own.

Pilgrim's Progress.—A celebrated allegory by Bunyan. It recounts the adventures of the hero, Christian, from his conversion to his death. He wanders from the way to Doubting Castle, and is held there by Giant Despair. His sins are a pack; his Bible is a chart, his minister Evangelist, his conversion a flight from the City of Destruction, his struggle with besetting sins a fight with Apollyon, his death a toilsome passage over a deep stream which flows between him and heaven.

Pilot, The.—Title of a sea-story by Cooper, which was called the "first sea-novel of the English language." It was published in the year 1823, and soon translated into Italian, German, and French. It is founded on the adventures of John Paul Jones.

Pinch, Tom.—A character in Dickens' *Martin Chuzzlewit*, distinguished by his guilelessness, his oddity, and his exhaustless goodness of heart.

Pippa (*pēp'pä*) **Passes.**—A drama, Italian in scene and character, by Robert Browning. "It is," says Stedman "a cluster of four scenes, with prologue, epilogue, and interludes, half prose, half poetry, varying with the refinement of the dialogue. Pippa is a delicately pure, good, blithesome peasant maid. It is New Year's Day at Ardo. She springs from bed at sunrise, resolved to enjoy to the full her sole holiday. Others may be happy throughout the year; haughty Ottima and Sebald, the lovers on the hill; Jules and Phene, the artist and his bride; Luigi and his mother; Monsignor, the bishop; but Pippa has only this one day to enjoy. Now, it so happens that she passes, this day, each of the groups or persons we have named, at an important crisis in their lives, and they hear her various carols as she trills them forth in the innocent gladness of her heart. *Pippa Passes* is a work of pure art, and has a wealth of original fancy and romance, apart from its wisdom." It appeared in 1842.

Pistol (*pis'tol*).—A follower of Falstaff, in Shakespeare's comedy of *The Merry Wives of Windsor*, and in the second part of *King Henry IV*. "A roguing beggar, a chantler, an upright man that liveth by cozenage."

Pocket.—*Great Expectations*, Dickens. Name of a family prominent in the story.

Pocket.—A real scholar, educated at Harrow, and an honor-man at Cambridge, but, having married young, he had to take up the calling of "grinder" and literary fag for a living. Pip was placed in his care.

Pocket, Herbert.—Son of Mr. Matthew Pocket, wonderfully hopeful, but had not the stuff to push his way into wealth.

Pocket, Mrs.—Daughter of a city knight, brought up to be an ornamental nonentity, helpless, shiftless, and useless. She was the mother of eight children, whom she allowed to "tumble up" as best they could, under the charge of her maid, Flopson.

Pocket, Sarah.—Sister of Matthew Pocket, a little, dry, old woman, with a small face that might have been made of walnut-shell, and a large mouth.

Poor Richard's Almanac.—An almanac published by Benjamin Franklin, 1732-1757, noted for its maxims. He made it the medium for teaching thrift, temperance, order, cleanliness, chastity, forgiveness, and so on. The maxims or precepts of these almanacs generally end with the words, "as poor Richard says."

Portia (*pôr'shiä*).—In *The Merchant of Venice*, a rich heiress, whose hand and fortune hang upon the right choosing between a gold, a silver, and a leaden casket. She is in love with Bassanio, who, luckily, chooses well. She appears at the trial of Antonio as a "young doctor of Rome," named Balthazar.

Poyser (*poi'zer*), **Mrs.**—A character in *Adam Bede*. Some of her wonderfully shrewd and humorous observations have passed into the language. Here are some specimens: "It seems as if them as aren't wanted here are th' only folks as aren't wanted in the other world." "I'm not denyin' the women are foolish; God Almighty made 'em to match the men." "It's hard to tell which is Old Harry when everybody's got boots on." "There's many a good bit o' work done with a sad heart." "It's poor work allays settin' the dead above the livin'. It 'ud be better if folks 'ud make much on us beforehand, istid o' beginning when we're gone." "Some folks' tongues are like the clocks as run on strikin' not to tell you the time of day, but because there's summat wrong in their own inside."

Précieuses Ridicules (*prā-syuz' ri-di-kul'*), **Les.**—A comedy by Molière, in ridicule of the *Préceuses*, as they were styled, forming the coterie of the Hotel de Rambouillet in the seventeenth century. The *soirées* held in this hotel were a great improvement on the licentious assemblies of the period; but many imitators made the thing ridiculous, because they lacked the same presiding talent and good taste.

The two girls of Molière's comedy are Madelon and Cathos, the daughter and niece of Gargibus, a bourgeois. They change their names to Polixène and Aminte, which they think more genteel, and look on the affectations of two flunkies as far more *distingués* than the simple, gentlemanly manners of their masters. However, they are cured of their folly, and no harm comes of it.

Prelude (*prē'lūd*, or *prel'ūd*), **The,** or *The Growth of a Poet's Mind*.—An autobiographical poem, in blank verse, by William Wordsworth. It was intended as an introduction to "a philosophical poem, containing views of Man, Nature, and Society; and to be entitled

The Recluse, as having for its principal subject the sensations and opinions of a poet living in retirement." This poem was to have consisted of three parts, of which the second only, *The Excursion*, was completed and published. *The Prelude* consists of fourteen books: Book one, *Childhood and Schooltime;* book two, *Schooltime*, continued; book three, *Residence at Cambridge;* book four, *Summer Vacation;* book five, *Books;* book six, *Cambridge and the Alps;* book seven, *Residence in London;* book eight, *Retrospect—Love of Nature Leading to Love of Man;* book nine, *Residence in France;* book ten, *Residence in France*, continued; book eleven, *France*, concluded; book twelve, *Imagination and Taste, How Impaired and Restored;* book thirteen, the same subject continued and concluded; and book fourteen, *Conclusion*.

Primrose (*prim'rōz*), **Rev. Charles.**—*Vicar of Wakefield*, Goldsmith. A clergyman, rich in heavenly wisdom, but poor indeed in all worldly knowledge.

Primrose, Moses.—Brother of the above, noted for giving in barter a good horse for a gross of worthless green spectacles with copper rims.

Primrose, Olivia.—The eldest daughter of the doctor. Pretty, enthusiastic, a sort of Hebê in beauty. "She wished for many lovers," and eloped with Squire Thorndill.

Primrose, Sophia.—The second daughter of Dr. Primrose. She was "soft, modest, and alluring."

Princess: *a Medley*.—A poem by Alfred Tennyson. "It is," says Stedman, "as he entitles it, a medley, constructed of ancient and modern materials—a show of mediæval pomp and movement, observed through an atmosphere of latterday thought and emotion. The poet, in his prelude, anticipates every stricture, and to me the anachronisms and impossibilities of the story seem not only lawful, but attractive. Tennyson's special gift of reducing incongruous details to a common structure and tone is fully illustrated in a poem made—

> " 'To suit with time and place,
> A Gothic ruin and a Grecian house,
> A talk at college and of ladies' rights,
> A fuedal knight in silken masquerade.'

Other works of our poet are greater, but none is so fascinating. Some of the author's most delicately musical lines are herein contained. The tournament scene is the most vehement and rapid passage in the whole range of Tennyson's poetry. The songs reach the high water mark of lyrical compositions. The five melodies—*As Thro' the Land, Sweet and Low, The Splendor Falls, Home They Brought* and *Ask Me No More*—constitute the finest group of songs produced in our century, and the third seems to many the most perfect English lyric since the time of Shakespeare." The name of the Princess is Ida.

Priscilla (*pri-sil'ä*).—*Courtship of Miles Standish*, Longfellow. A Puritan maiden who is wooed by Captain Standish through the mediation of his friend, John Alden, who is in love with Priscilla. She prefers John Alden and marries him after the captain's supposed death. The captain, however, appears at the close of the wedding service, and the friends are reconciled.

Prometheus (*prō-mē'thūs*) **Bound.**—A tragedy of Æschylus, of uncertain date. Prometheus, is fabled to have made men of clay, and to have imparted life to them by means of fire brought from heaven. It was said that for this he was bound to the rock by order of Zeus, that he resisted all efforts to subdue his will and purpose, bade defiance to the father of the gods, and disappeared in an appalling tempest. Mrs. Browning published a poetical translation in 1833.

Prospero (*pros'pe-rō*).—*Tempest*, Shakespeare. Rightful duke of Milan, deposed by his brother. Drifted on a desert island, he practised magic, and raised a tempest in which his brother was shipwrecked. Ultimately Prospero "broke his wand," and his daughter married the son of the King of Naples.

Puff, Mr.—In Sheridan's farce *The Critic*, a hack writer, who, having failed at other occupations, tries criticism for a living, and is a "professor of the art of puffing."

Puss in Boots.—The subject and title of a wellknown nursery tale derived from a fairy story in the *Nights* of the Italian author Straparola, and Charles Perrault's *Contes des Fées*. The wonderful cat secures a princess and a fortune for his master, a poor young miller, whom he passes off as the rich marquis of Carabas.

Pygmalion (*pig-mā'li-on*) **and Galatea** (*gal-a-tē'ä*).—A mythological comedy, by W. S. Gilbert, embodying the fable of the Athenian sculptor who prayed the gods to put life into the statue of Galatea which he had fashioned. In the comedy, Galatea evokes the jealousy of the sculptor's wife Cynisca; and, after causing great misery by her very innocence, voluntarily returns to the original stone.

Pyncheon (*pin'chon*).—The name of an ancient but decayed family in Hawthorne's romance *The House of the Seven Gables*. There are: (1) Judge Pyncheon, a selfish, cunning, worldly man. (2) His cousin Clifford, a delicate, sensitive nature, reduced to childishness by long imprisonment and suffering. (3) Hepzibah, the latter's sister, an old maid who devotes herself to the care of Clifford. (4) A second cousin, Phœbe, a fresh, cheerful young girl, who restores the fallen fortunes of the family and removes the curse which rested on it.

Q

Quasimodo (*kwä-si-mō'dō*).—*Notre Dame de Paris*, Hugo. A misshapen dwarf, one of the prominent characters in the story. He is brought up in the cathedral of Notre Dame de Paris. One day, he sees Esmeralda, who had been dancing in the cathedral close, set upon by a mob, and he conceals her for a time in the church. When, at length, the beautiful gypsy girl is gibbeted, Quasimodo disappears mysteriously, but a skeleton corresponding to the deformed figure is found after a time in a hole under the gibbet.

Quaver.—*The Virgin Unmasked*, Fielding. A singing-master, who says, "if it were not for singing-masters, men and women might as well have been born dumb." He courts Lucy by promising to give her singing-lessons.

Queen Lab.—*Arabian Nights*. The queen of magic, ruler over the enchanted city, in the story of Beder, prince of Persia. She transforms men into horses, mules, and other animals. Beder marries her, defeats her plots against him, but is himself turned into an owl for a time.

Quentin Durward (*kwen'tin der'wärd*).—A novel by Sir Walter Scott. A story of French history. The delineations of Louis XI. and Charles the Bold of Burgundy will stand comparison with any in the whole range of fiction or history.

Quickly, Mistress.—*Merry Wives of Windsor*, Shakespeare. A serving woman to Dr. Caius, a French physician. She is the go-between of three suitors for "sweet Anne Page," and with perfect disinterestedness wishes all three to succeed.

Quickly, Mistress Nell.—Hostess of a tavern in Eastcheap, frequented by Harry, Prince of Wales, Sir John Falstaff, and all their disreputable crew.

Quidnunkis.—Title and name of hero in a fable found or written by Gay in 1726. This hero was a monkey which climbed higher than its neighbors, and fell into a river.

Quilp (*kwilp*).—*Old Curiosity Shop*, Dickens. A hideous dwarf, cunning, malicious, and a perfect master in tormenting. Of hard, forbidding features, with head and face large enough for a giant, he lived on Tower hill, collected rents, advanced money to seamen, and kept a sort of wharf, calling himself a ship-breaker.

Quintus Fixlein.—Title of a romance by Jean Paul Richter and the name of the principal character.

Quirk, Gammon, and Snap.—A firm of rascally, scheming, hypocritical solicitors in Warren's *Ten Thousand a Year*.

R

Raby, Aurora.—In Byron's *Don Juan*. She was a rich, noble English orphan, "a rose with all its sweetest leaves yet folded."

Radigund.—*Faërie Queene*, Spenser. Queen of the fabled Amazons. Having been rejected by Bellodant "the Bold," she revenged herself by degrading all the men who fell into her power by dressing them like women, and giving them women's work.

Ramayana [(*rä-mä'yä-nä*); *Rāma-ayana*, the goings or doings of Rama].—One of the two great epics of India, the other being the Mahabharata. It is ascribed to a poet, Valmiki, and consists at present of about twenty-four thousand stanzas, divided into seven books. It is the production of one man, though many parts are later additions, such as those in which Rama is represented as an incarnation of Vishnu, all the episodes in the first book, and the whole of the seventh. It was at first handed down orally, and variously modified in transmission, and afterward reduced to writing.

Ramona (*ra-mō'nä*).—Title of a romance by Helen Hunt Jackson. Ramona saw the American Indian followed by "civilization" while retreating slowly but surely toward his own extinction, and had herself a share in the tragedy. Ramona is considered the great romance of Indian life.

Random (*ran'dom*).—*Roderick Random*, Smollett. A young Scotch scapegrace in quest of fortune. At one time he revels in prosperity, again he is in utter destitution. He roams at random, in keeping with his name.

Rappaccini (*rap-ä-chē'nē*).—*Mosses from an Old Manse*, Hawthorne. A doctor in whose garden grew strange plants whose juices and fragrance were poison. His daughter, nourished on these odors, became poisonous herself. Her lover found an antidote which she took, but the poison meant life and the antidote meant death to her.

Rasselas (*ras'e-las*).—An imaginary romance by Dr. Johnson. According to the custom of his country, Abyssinia, Rasselas was confined in paradise, with the rest of the royal family. This paradise was in the valley of Amhara, surrounded by high mountains. It had only one entrance, a cavern concealed by woods, and closed by iron gates. He escaped with his sister Nekayah and Imlac the poet, and wandered about to find what condition or rank of life was the most happy. After investigation, he found no lot without its drawbacks, and resolved to return to the "Happy Valley."

Raud the Strong.—*Tales of a Wayside Inn*, Henry W. Longfellow. The viking who worshiped the old gods and lived by fire and sword. King Olaf went against him, sailing from Drontheim to Salten Fjord.

Raven, The.—A poem by Edgar Allan Poe, published in 1845, which has attained a world-wide popularity. For the author's account of the mode of its construction, see *The Philosophy of Composition*, an essay, in the collected edition of his works. The last verse runs:

And the Raven, never flitting, still is sitting, still is sitting,
On the pallid bust of Pallas, just above my chamber door;
And his eyes have all the seeming of a demon's that is dreaming,
And the lamplight o'er him streaming throws his shadow on the floor;
And my soul from out that shadow that lies floating on the floor
Shall be lifted—Nevermore!

Ravenswood.—*Bride of Lammermoor*, Scott. The lord of Ravenswood, an old Scotch nobleman and a decayed royalist. His son Edgar falls in love with Lucy Ashton, daughter of Sir William Ashton, Lord-Keeper of Scotland. The lovers plight their troth, but Lucy is compelled to marry Frank Hayston, laird of Bucklaw. The bride, in a fit of insanity, attempts to murder the bridegroom and dies. Bucklaw goes abroad. Colonel Ashton, seeing Edgar at the funeral of Lucy, appoints a hostile meeting; and Edgar, on his way to the place appointed, is lost in the quicksands. A prophecy, noted as a curse, hung over the family and was thus fulfilled.

Raymond.—In *Jerusalem Delivered*, by Tasso. Raymond was known as the Nestor of the crusaders, slew Aladine, the king of Jerusalem, and planted the Christian standard upon the tower of David.

Rebecca.—*Ivanhoe*, Scott. Daughter of Isaac the Jew, in love with Ivanhoe.

Red-cross Knight.—The Red-cross Knight is St. George, the patron saint of England, and, in the obvious and general interpretation, typifies holiness, or the perfection of the spiritual man in religion. In Spenser's *Faërie Queene* the task of slaying a dragon was assigned to him as the champion of Una.

Redgauntlet (*red-gänt'let*).—One of the principal characters in Sir Walter Scott's novel of the same name, a political enthusiast and Jacobite, who scruples at no means of upholding the cause of the Pretender and finally accompanies him into exile. His race bore a fatal mark resembling a horseshoe which appeared on the face of Red-gauntlet as he frowned when angry.

Red-Riding-Hood.—This nursery tale is, with slight variations, common to Sweden, Germany, and France. In Charles Perrault's *Contes des Fées* it is called *Le Petit Chaperon Rouge.*

Religio Medici (*rē-lij'i-ō med'i-sī*).—A prose work by Sir Thomas Browne. "*The Religio Medici*," says the elder Lytton, "is one of the most beautiful prose poems in the language; its power of diction, its subtlety and largeness of thought, its exquisite conceits and images, have no parallel out of the writers of that brilliant age when Poetry and Prose had not yet divided their domain, and the Lyceum of Philosophy was watered by the mixing of the wine!"

Representative Men.—A work by Emerson which more nearly than any of his other works, gives expression to his system as a whole. The topics are: (1) Plato, the Philosopher; (2) Swedenborg, the Mystic; (3) Montaigne, the Skeptic; (4) Shakespeare, the Poet; (5) Napoleon, the Man of the World; (6) Goethe, the Writer. The mental portraits sketched under these six heads give us Emerson himself, so far as he is capable of being formulated at all.

Republic, The.—A work composed by Plato four hundred years before Christ. *The Republic* is not, as the title would suggest, a political work, like the *Politics* of Aristotle. The principles and government of an ideal moral organism, of which the rulers shall be types of fully developed and perfectly educated men, are the real subject. In the *Republic* we find the necessity of virtue to the very idea of social life proved in the first book; then the whole process of a complete moral and scientific education is set forth. It has been said that the most complete record of the beliefs or opinions of Plato are found in this work.

Reveries of a Bachelor.—By D. G. Mitchell. The *Reveries* is a collection of sketches of life and character, painted in such a dreamlike, delicate manner as to make the reader lose for the time being the full consciousness of his surroundings. It has called forth a number of imitators more or less successful, no one of whom, however, is comparable to the original.

Reynard (*rā'närd*, or *ren'ärd*) **the Fox.**—A beast-epic, so called. This prose poem is a satire on the state of Germany in the middle ages. Reynard represents the Church; Isengrin the wolf (his uncle) typifies the baronial element; and Nodel the lion stands for the regal power. The plot turns on the struggle for supremacy between Reynard and Isengrin. Reynard uses all his endeavors to victimize everyone, especially his uncle Isengrin, and generally succeeds.

Richelieu (*rēsh-y-lōō'*), or *The Conspiracy.*—A drama in five acts, by Edward, Lord Lytton; produced in 1839, the part of the hero being played by Macready. For some of the incidents the author confesses himself indebted to the authors of *Cinq Mars* and *Picciola.* Among the characters are Baradas, the favorite; De Mauprat, in love with Julie; Julie de Mortemar herself; Marion de Lorme, mistress of Orleans; Orleans himself; Louis XIII., and others.

Rights of Man, The.—"Being an answer to Mr. Burke's Attack on the French Revolution," by Thomas Paine. This work, which was published in 1791-1792, procured for the writer the distinction of a trial for sedition, which he escaped by flying to France.

Rinaldo (*ri-nal'dō*).—A Christian hero in Tasso's *Jerusalem Delivered.* He was the son of Bertoldo and Sophia, and nephew of Guelpho, but was brought up by Matilda. He was one of Charlemagne's paladins, and cousin to Orlando. Having killed Charlemagne's nephew Berthelot, he was banished and outlawed. After various adventures and disasters, he went to the Holy Land, and, on his return, succeeded in making peace with the emperor.

Ring and the Book, The.—A poem by Robert Browning, published in 1869. It is the story of a tragedy which took place at Rome in 1698. The versified narrative of the child Pompilia's sale to Count Guido, of his cruelty and violence, of her rescue by a young priest, the pursuit, the lawful separation, the murder by Guido of the girl and her putative parents, the trial and condemnation of the murderer, and the affirmation of his sentence by the pope—all this is made to fill out a poem of twenty-one thousand lines; but these include ten different versions of the tale, besides the poet's prelude, in which latter he gives a general outline of it. The chapters which contain the statements of the priest lover and Pompilia are full of tragic beauty and emotion. The pope's soliloquy, though too prolonged, is a wonderful piece of literary metempsychosis.

Rip Van Winkle.—A tale by Washington Irving, adapted from the old German legend of Peter Klaus, a goatherd, who drank a miraculous draught of wine in a dell of the Harz mountains, which brought on sleep from which he did not wake until twenty years after, when he returned to his native village to find everything changed, and no one who knew him. In Irving's tale the hero is a Dutchman living in America, and the scene is the Catskill mountains. The story is most picturesquely told, and has been effectively dramatized, the leading personage being illustrated by the genius of Jefferson.

Rivals, The.—A comedy by Richard Brinsley Sheridan, produced at Covent Garden, London, in 1775, and described by Hazlitt as "a play of even more action and incident, but of less wit and satire, than *The School for Scandal.* It is as good as a novel in the reading, and has the broadest and most palpable effect upon the stage."

Roaring Camp, The Luck of.—A prose sketch by Francis Bret Harte, an American poet, in which the softening effects of the presence of a little child in a camp of ruffians are very touchingly described. It has been dramatized.

Rob Roy.—A romance by Sir Walter Scott which is founded on some passages in the career of the famous Highlander, Robert MacGregor, who was popularly

called Rob Roy. The nominal hero of *Rob Roy* is Francis Osbaldistone; the heroine, Diana Vernon. Among the other characters are Baillie Nicol Jarvie, "The Dougal Cratur" Andrew Fairservice, Helen MacGregor, Sir Frederick Vernon, and Rashleigh Osbaldistone. The novel has been dramatized in a version which still holds the stage in Scotland. Scott speaks of Rob as "the Robin Hood of Scotland—the dread of the wealthy, but the friend of the poor, and possessed of many qualities, both of head and heart, which would have graced a less equivocal profession than that to which his fate condemned him."

Roderick, or **Roderic** (*rod'er-ik*) **Dhu.**—*Lady of the Lake*, Scott. An outlaw and chief of a band of Scots who resolved to win back what had been lost to the Saxons. In connection with Red Murdock he sought the life of the Saxon Fitz-James.

Roderigo (*rod-e-rē'gō*).—In Shakespeare's *Othello*, a Venetian in love with Desdemona, who, when the lady eloped with Othello, hated the "noble Moor."

Roland (*rō'land*).—The hero of one of the most ancient and popular epics of early French or Frankish literature, and, according to tradition, the favorite nephew and captain of the Emperor Charlemagne. Roland is the hero of Théroulde's *Chanson de Roland*, of Turpin's *Chronique;* of Bojardo's *Orlando Innamorato;* of Ariosto's *Orlando Furioso*.

Romance of the Rose.—A poetical allegory, begun by Guillaume de Lorris in the latter part of the thirteenth century, and continued by Jean Meung in the first half of the fourteenth century. The poet dreams that Dame Idleness conducts him to the Palace of Pleasure, where he meets many adventures among the attendant maidens, Youth, Joy, Courtesy, and others, by whom he is conducted to a bed of roses. He singles out one, when an arrow from Love's bow stretches him fainting on the ground. Fear, Slander, and Jealousy are afterward introduced.

Romeo.—In Shakespeare's tragedy of *Romeo and Juliet*, a son of Montague, in love with Juliet, the daughter of Capulet, who was the head of a noble house of Verona, in feudal enmity with the house of Montague.

Romeo and Juliet.—A tragedy by William Shakespeare. Romeo, a son of Montague, in love with Juliet, the daughter of Capulet; but between the houses of Montague and Capulet there existed a deadly feud. As the families were irreconcilable, Juliet took a sleeping draught, that she might get away from her parents and elope with Romeo. Romeo, thinking her to be dead, killed himself; and when Juliet awoke and found her lover dead, she also killed herself.

Romola (*rom'ō-lä*).—A novel of Italian life and character by George Eliot. *Romola* is a marvelously able story of the revival of the taste and beauty and freedom of Hellenic manners and letters, under Lorenzo de' Medici and the scholars of his court, side by side with the revival of Roman virtue, and more than the ancient austerity and piety, under the great Dominican Savonarola. This period of history is one which of all others may well have engrossing interest for George Eliot. Treasures of learning and discipline, amassed for mankind ages before, for ages stored and hidden away, see again the sun, are recognized and put to use. What use they will be put to, with what new and fruitful effects on the state and the citizen, with what momentary and with what lasting consequences, this she strives to discover; this she follows through the public history of Italy during the modern invasion of Charles VIII., and the events which succeed his invasion, and through the private fortunes of her admirably chosen group of characters, some of them drawn from life, all of them true to nature.

Rosetta (*rō-zet'tä*) **Stone.**—Found at Rosetta in the delta of the Nile, contains equivalent inscriptions in hieroglyphics in demotic and in Greek letters. The meaning of the Greek text being known, the hieroglyphics could be translated.

Rowena (*rō-ē'nä*).—A Saxon princess, ward of Cedric of Rotherwood, in Sir Walter Scott's romance of *Ivanhoe*.

Rumpelstilzchen.—*Old German Tales*. According to Grimm, this name is a compound, but the spirit represented is one familiar to all German children. The original story tells of him as a dwarf who spun straw into gold for a certain miller's daughter.

S

Sacripant (*sak'ri-pant*), **King.**—(1) King of Circassia, and a lover of Angelica, in Bojordo and Ariosto. (2) A personage in Tassoni's mock heroic poem, *Rape of the Bucket*, represented as false, brave, noisy and hectoring.

Sagas (*sä'gas*).—Title of the ancient traditions which form the substance of the history and mythology of the Scandinavian races. The language in which they are written is supposed to be the old Icelandic. In the *Edda* there are numerous sagas. As our Bible contains the history of the Jews, religious songs, moral proverbs, and religious stories, so the *Edda* contains the history of Norway, religious songs, a book of proverbs, and numerous stories. The original *Edda* was compiled and edited by Sæmund Sigfusson, an Icelandic priest and scald, in the eleventh century. It contains twenty-eight parts or books, all of which are in verse. Two hundred years later Snorri Sturleson, of Iceland, abridged, rearranged, and reduced to prose the *Edda*, and his work was called *The Younger Edda*. In this we find the famous story called by the Germans the *Nibelungenlied*. Besides the sagas contained in the *Eddas*, there are numerous others, and the whole saga literature makes over two hundred volumes. Among them are the *Völsunga Saga*, which is a collection of lays about the early Teutonic heroes. The *Saga of St. Olaf* is the history of this Norwegian king. *Frithjof's Saga* contains the life and adventures of Frithjof of Iceland. Snorri Sturleson, at the close of the twelfth century, made the second great collection of chronicles in verse, called the *Heimskringla Saga*. This is a most valuable record of the laws, customs and manners of the ancient Scandinavians.

Sakuntala.—A famous drama by Kâlidasa. The daughter of Viswamita and a water nymph, abandoned by her parents, and brought up by a hermit. One day, King Dushyanta came to the hermitage, and persuaded Sakuntala to marry him. In due time a son was born, but Dushyanta left his bride at the hermitage. When the boy was six years old, his mother took him to the king, and Dushyanta recognized his wife by a ring which he had given her. Sakuntala was now publicly proclaimed queen, and the boy (whose name was Bhârata) became the founder of the glorious race of the Bhâratas.

Samson Agonistes (*sam'son ag-o-nis'tēz*).—A sacred drama by Milton. Samson, blind and bound, triumphs over his enemies. As in the Bible story, he grasps two of the supporting pillars, and perishes in the general ruin.

Sancho Panza (*sang'kō pan'zä*).—The esquire and counterpart of Don Quixote in Cervantes' famous novel. He has much shrewdness in practical matters, and a store of proverbial wisdom. He rode upon an ass and was noted for his proverbs.

Sartor Resartus (*sär'tor rē-sär'tus*), (*i. e., The Tailor Patched*).—The title of an old Scottish ballad, being *The Life and Opinions of Herr Teufelsdröckh, in Three Books*, by Thomas Carlyle. In may be described as a kind of philosophical romance, in which the author gives us, in the form of a review of a supposed German work on dress, and a notice of the writer, his opinions on things in general. The hero, it has been said, seems to be intended for a portraiture of human nature as affected by the moral influence to which a cultivated mind would be exposed by acquaintance with the transcendental philosophy of Fichte.

Satyrane (*sat'i-rān*), **Sir.**—*Faërie Queene*, Spenser. A noble knight who delivered Una from the fauns and satyrs. The meaning seems to be that Truth, driven from the towns and cities, took refuge in caves and dens where for a time it lay concealed. At length Sir Satyrane (Luther) rescues Una from bondage; but no sooner is this the case than she falls in with Archimago, to show how very difficult it was at the time of the Reformation to separate Truth from Error.

Sawyer, Bob.—*Pickwick Papers*, Dickens. A drinking young doctor who tries to establish a practice at Bristol, but without success. Sam Weller calls him "Mr. Sawbones."

Scalds, or **Skalds.**—Court poets and chroniclers of the ancient Scandinavians. They resided at court, were attached to the royal suite, and attended the king in all his wars. These bards celebrated in song the gods, the kings of Norway, and national heroes. Few complete Skaldic poems have survived, but a multitude of fragments exist.

Scarlet Letter, The.—A romance by Nathaniel Hawthorne, published in 1850. The heroine, Hester Prynne, was condemned to wear conspicuously the letter "A" in scarlet, token of her sin as mother of her child, Pearl, whose father was not known. She was first exposed in disgrace on a raised scaffold, then served a term in prison, and afterward gained a moderate support for herself and child by embroidering. She refused to reveal the name of the father, although she might then be allowed to lay aside the letter. He was always near, held an important position, and lived a life of wearing remorse. After his death Hester Prynne took her child to another country, but returned to spend her old age in seclusion and com-

fort in the same place that had witnessed her punishment. She always bore herself proudly, but not defiantly, and brought to herself such love and respect that the scarlet letter became a badge of honor. Roger Chillingworth, Hester's husband, appeared as a learned foreign physician, visited her in prison, but promised not to reveal his relation to her, and devoted his life to learning her secret. The characters in the story are intense, and the analysis of motives subtle.

Scheherazade, or **Sheherazade** (*she-hē'rā-zād*).—*Arabian Nights.* The fabled relater of the stories in these "Entertainments."

Scaramouche (*skar'a-mouch*).—An Italian character whose traits are cowardice and boastfulness. He is of Spanish creation, copied into Italian comedy.

Schlemihl (*shlem'el*), **Peter.**—The name of the hero of a little work by Chamisso, a man who sells his shadow to the devil. The name has become a byword for any poor, silly, and unfortunate fellow.

Schneider (*shnī'der*).—Rip Van Winkle's dog, in Boucicault's dramatization of Irving's *Rip Van Winkle.* The name of the dog in the story is "Wolf."

School for Scandal, The.—A comedy by Richard Brinsley Sheridan, produced at Covent Garden, London, in 1777, and characterized by Hazlitt as, "if not the most original, perhaps the most finished and faultless comedy which we have. The scene in which Charles Surface sells all the old family pictures but his uncle's, who is the purchaser in disguise, and that of the discovery of Lady Teazle when the screen falls, are among the happiest and most highly wrought that comedy, in its wide and brilliant range, can boast. Besides the art and ingenuity of this play, there is a genial spirit of frankness and generosity that relieves the heart as well as clears the lungs. While it strips off the mask of hypocrisy, it inspires a confidence between man and man."

School for Wives [*L'École des Femmes* (*lā-kol' dā fam'*)].—A comedy by Molière. Arnolph has a crotchet about the proper training of girls to make good wives, and tries his scheme upon Agnes, whom he adopts from a peasant's cottage, and designs in due time to make his wife. He sends her from early childhood to a convent, where difference of sex and the conventions of society are wholly ignored. When removed from the convent, she treats men as if they were schoolgirls, kisses them, plays with them, and treats them with girlish familiarity. The consequence is, a young man name Horace falls in love with her, and makes her his wife, and Arnolph loses his painstaking.

School of Husbands [*L'Ecole des Maris* (*lā-kol' da mā-re'*)] A comedy by Molière. Ariste and Sganarelle, two brothers, bring up Léonor and Isabelle, two orphan sisters, according to their systems for making them in time their model wives. Sganarelle's system was to make the woman dress plainly, live retired, attend to domestic duties, and have few indulgences. Ariste's system was to give the woman great liberty, and trust to her honor. Isabelle, brought up by Sganarelle, deceived him and married another; but Léonor, brought up by Ariste, made him a fond and faithful wife.

Scottish Chiefs, The.—A romantic story by Jane Porter, published in 1810, and counting among its heroes Robert Bruce and Sir William Wallace.

Scourge of God.—Attila, king of the Huns. A. P. Stanley says the term was first applied to Attila in the Hungarian *Chronicles.* It is found in a legend belonging to the eighth or ninth century.

Scrooge (*skröj*), **Ebenezer.**—*Christmas Carol,* Dickens. The prominent character, made partner, executor, and heir of old Jacob Marley, stockbroker.

Seasons, The.—A series of poems by James Thomson, which appeared in the following order: *Winter; Summer; Spring;* and *Autumn;* the whole being republished, with the famous *Hymn.* Horace Walpole said that he would rather have written the most absurd lines by Lee than *The Seasons;* but Wordsworth, on the other hand, speaks of it as "a work of inspiration. Much of it," he says, "is written from himself, and nobly from himself."

Sebastian (*se-bas'tian*).—(1) Brother of Viola, in *Twelfth Night.* They were twins, and so much alike that they could not be distinguished except by their dress. Sebastian and his sister being shipwrecked, escaped to Illyria. Here Sebastian was mistaken for his sister (who had assumed man's apparel), and was invited by the Countess Olivia to take shelter in her house from a street broil. Olivia was in love with Viola, and thinking Sebastian to be the object of her love, married him. (2) Brother of Alfonso, king of Naples, in *The Tempest.* (3) Father of Valentine and Alice, in Beaumont and Fletcher's *Mons. Thomas.*

Sedley, Mr.—*Vanity Fair,* Thackeray. A wealthy London stockbroker, brought to ruin in the money market just prior to the battle of Waterloo.

Selith.—One of the two guardian angels of the Virgin Mary and St. John the divine, in Klopstock's *Messiah.*

Sempronius (*sem-prō'ni-us*).—In Shakespeare's *Timon of Athens,* a flatterer of Timon, who excuses himself from lending Timon money on the ground that others had been asked first.

Senena.—*Madoc,* Southey. A Welsh maiden in love with Caradoc. Under the assumed name of Mervyn she became the page of the Princess Goervyl, that she might follow her lover to America, where Madoc colonized Caer-Madoc. Senena was promised in marriage to another; but when the wedding day arrived the bride was nowhere to be found.

Sentimental Journey Through France and Italy.—By Laurence Sterne, published in 1768. Sterne describes this work as follows: "It is a subject which works well, and suits the frame of mind in which I have been for some time past. I told you my design in it was to teach us to love the world and our fellow creatures better than we do—so it runs most upon these gentler passions and affections which add so much to it."

Serena (*sā-rā'nā*).—*Faërie Queene,* Spenser. Allured into the fields by the mildness of the weather, to gather wild flowers for a garland, she was attacked by the Blatant Beast, which carried her off in its mouth. Her cries attracted to the spot Sir Calidore, who compelled the beast to drop its prey.

Sesame.—In Arabian tales given as the talismanic word which would open or shut the door leading into the cave of the forty thieves. In order to open it, the words to be uttered were, "Open, Sesame!" and in order to close it, "Shut, Sesame!" Sesame is a plant yielding grain which is sometimes used for food, and from which an oil is expressed. When Cassim forgot the word, he substituted "Barley," but without effect. Sesame has come into general use in connection with any word or act which will open the way for accomplishment of the thing desired.

Seven Lamps of Architecture, The.—A treatise on architecture by Ruskin, published in 1849. The "seven lamps" are those of Sacrifice, Truth, Power, Beauty, Life, Memory, and Obedience. They are symbolic rules for the guidance of the student.

Sganarelle (*sgā-nā-rel'*).—The hero of Molière's comedy *La Mariage Force.* He is represented as a humorist of about fifty-three, who, having a mind to marry a fashionable young woman, but feeling a doubt, consults his friends upon this momentous question. Receiving no satisfactory counsel, and not much pleased with the proceedings of his bride elect, he at last determines to give up his engagement, but is cudgeled into compliance by the brother of his intended.

Shallow.—A braggart and absurd country justice in Shakespeare's *Merry Wives of Windsor,* and in the second part of *King Henry IV.*

Shandy, Mrs.—The mother of Tristram Shandy in Sterne's novel of this name. She is the ideal of nonentity, a character individual from its very absence of individuality.

Shandy, Tristram.—The nominal hero of Sterne's *The Life and Opinions of Tristram Shandy, Gent.*

Shandy, Walter.—The name of Tristram Shandy's father in Sterne's novel of this name, a man of an active and metaphysical, but at the same time a whimsical, cast of mind, whom too much and too miscellaneous learning had brought within a step or two of madness.

Sharp, Becky.—A leading character in Thackeray's *Vanity Fair,* the daughter of a poor painter, dashing, selfish, unprincipled, and very clever.

Shepherd of Salisbury Plain, The.—The hero and title of a religious tract by Hannah More. The shepherd is noted for his homely wisdom and simple piety.

Shepherd's Calendar, The.—Twelve eclogues in various meters, by Spenser, one for each month. January: Colin Clout (Spenser) bewails that Rosalind does not return his love. February: Cuddy, a lad, complains of the cold, and Thenot laments the degeneracy of pastoral life. March: Willie and Thomalin discourse of love. April: Hobbinol sings a song on Eliza. May: Palinode exhorts Piers to join the festivities of May, but Piers replies that good shepherds who seek their own indulgence expose their flocks to the wolves. June: Hobbinol exhorts Colin to greater cheerfulness. July: Morrel, a goatherd, invites Thomalin to come with him to the uplands. August: Perigot and Willie contend in song, and Cuddy is appointed arbiter. September: Diggon Davie complains to Hobbinol of clerical abuses. October: On poetry. November: Colin being asked by Thenot to sing, excuses himself because of his grief for Dido, but finally sings her elegy. December: Colin again

complains that his heart is desolate. Thenot is an old shepherd bent with age, who tells Cuddy, the herdsman's boy, the fable of the oak and the brier, one of the best-known fables included in the calendar.

Shepherd's Pipe.—Pan, in Greek mythology, was the god of forests, pastures, and flocks, and the reputed inventor of the shepherd's flute or pipe.

Sheridan's Ride.—A lyric by T. B. Read, one of the few things written during the heat of the Civil war that is likely to survive.

She Stoops to Conquer.—A comedy by Oliver Goldsmith, said to have been founded on an incident which actually occurred to its author. When Goldsmith was sixteen years of age, a wag residing at Ardagh directed him, when passing through that village, to Squire Fetherstone's house as the village inn. The mistake was not discovered for some time, but all concerned enjoyed the joke. *She Stoops to Conquer* is one of the gayest, pleasantest, and most amusing pieces of English comedy.

Shingebis.—In Longfellow's *Hiawatha*, the diver who challenged the North Wind and put him to flight in combat.

Shocky.—*The Hoosier Schoolmaster*, Edw. Eggleston. The little lad from the poorhouse who adores the schoolmaster and early warns him of plans for upsetting his authority. He is also a small poet, not in rhyming, but in comprehension of things about him and in his way of looking at life, and he grows to be a helper in the *Church of the Best Licks*, founded by the schoolmaster.

Shylock.—A sordid, avaricious, revengeful Jew, in Shakespeare's *Merchant of Venice*.

Siege Perilous, The.—The Round Table contained sieges, or seats, in the names of different knights. One was reserved for him who was destined to attainment in the quest of the Holy Grail. This seat was called "perilous" because if anyone sat therein except he for whom it was reserved. he would "lose himself." It finally bore the name of Sir Galahad.

Siegfried (*sēg'frēd*).—The hero of various Scandinavian and Teutonic legends, particularly of the old German epic poem, the *Nibelungenlied*. He is represented as a young warrior of physical strength and beauty, and in valor superior to all men of his time. He cannot easily be identified with any historical personage.

Sikes, Bill.—A brutal thief and housebreaker in Dickens' novel *Oliver Twist*. He murders his mistress, Nancy, and, in trying to lower himself by a rope from the roof of a building where he had taken refuge from the crowd, he falls, and is choked in a noose of his own making. Sikes had an ill-conditioned, savage dog, the beast-image of his master, which he kicked and loved, ill-treated and fondled.

Silas Marner (*mär'ner*).—A novel by George Eliot, published in 1861. This novel is one of the authoress' most beautiful stories, the most poetical of them all—the tale of Silas Marner, who deems himself deserted and rejected utterly of God and man, and to whom, in his deepest misery, in place of lost gold, a little foundling girl is sent. This tale is the most hopeful of all her books. The contemplation of the renewal of enterprise and energy, which comes with little children, and of the promise with which each new generation gilds the crown of honor for its sires, is pleasant and grateful to her. She writes upon her title page the lines of Wordsworth:

> A child, more than all other gifts
> That earth can offer to declining man,
> Brings hope with it and forward-looking thoughts.

The weaver of Raveloe and Eppie are creations after Wordsworth's own heart.

Silken Thread.—*Gulliver's Travels*. In the kingdom of Lilliput, the three great prizes of honor are "fine silk threads six inches long, one blue, another red, and a third green." The thread is girt about the loins, and no ribbon of the Legion of Honor, or of the Knight of the Garter, is worn more worthily or more proudly.

Sindbad (*sind'bad*) **the Sailor.**—A character in the *Arabian Nights*, in which is related the story of his strange voyages and wonderful adventures.

Sinon.—In Vergil's *Æneid* the cunning Greek who, by a false tale, induced the Trojans to drag the wooden horse into Troy.

Sir Roger de Coverley (*kuv'er-li*).—In Addison's *The Spectator*. The prototype of this famous character was Sir John Pakington, a hypothetical baronet of Coverley or Cowley, near Oxford.

Skeleton in Armor, The.—A lyric by Henry Wadsworth Longfellow, suggested to him while riding on the seashore at Newport. A year or two previous a skeleton had been dug up at Fall River, clad in broken and corroded armor; and the idea occurred to him of connecting it with the Round Tower at Newport, generally known hitherto as the Old Windmill, though now claimed by the Danes as a work of their early ancestors.

Sketch-Book, The.—A series of short tales, sketches, and essays, published by Washington Irving in 1820. They are chiefly descriptive of English manners and scenery, and have often been reprinted.

Skylark, Ode to the.—By Percy Bysshe Shelley, written in 1820. "In sweetness," says Leigh Hunt, "and not even there in passages, the *Ode to the Skylark* is inferior only to Coleridge—in rapturous passion to no man. It is like the bird it sings—enchanting, profuse, continuous, and alone; small, but filling the heavens."

> Hail to thee, blithe spirit!
> Bird thou never wert,
> That, from heaven, or near it,
> Pourest thy full heart
> In profuse strains of unpremeditated art.

Slick, Sam.—The hero of various humorous narratives, by Haliburton, illustrating and exaggerating the peculiarities of the Yankee character and dialect.

Slop, Dr.—The name of a choleric and uncharitable physician in Sterne's *Tristram Shandy, Gent.*

Slough of Despond.—*Pilgrim's Progress*, Bunyan. A deep bog, which Christian had to pass on his way to the Wicket Gate.

Sly, Christopher.—*Taming of the Shrew*, Shakespeare. A keeper of bears and a tinker and a sad drinker, son of a peddler.

Sofronia (*sof-rō'ni-ä*).—A young Christian of Jerusalem, the heroine of an episode in Tasso's *Jerusalem Delivered*. She and her lover, Olinda, are condemned to death by Aladine, king of Jerusalem. The king finally, at the solicitation of Clorinda, spares them and they are married.

Sohrab (*sō-hräb'*) **and Rustum.**—An episode, or narrative in verse, by Matthew Arnold. The story is told in prose in Sir John Malcolm's *History of Persia*. "The powerful conception of the relation between the two chieftains, and the slaying of the son by the father, are," says Stedman, "tragical and heroic. The descriptive passage at the close beginning—

> But the majestic river floated on,

for diction and breadth of tone would do honor to any living poet."

Song of Roland.—An ancient song recounting the deeds of Roland, the renowned nephew of Charlemagne, slain in the pass of Roncesvalles. At the battle of Hastings, Taillefer advanced on horseback before the invading army, and gave the signal for onset by singing this famous song.

Spanker, Lady Gay.—In *London Assurance*, by Boucicault, is a woman of great spirit, devoted to the chase.

Speed.—An inveterate punster and the clownish servant of Valentine, one of the two "gentlemen" in Shakespeare's *The Two Gentlemen of Verona*.

Spenlow (*spen'lō*).—*Lavinia* and *Clarissa*, in Dickens' *David Copperfield*, two spinster aunts of Dora Spenlow, with whom she lived at the death of her father.

Squeers.—Name of a family prominent in Dickens' *Nicholas Nickleby*. Wackford Squeers, master of Dotheboys Hall, in Yorkshire, is a vulgar, conceited, ignorant schoolmaster, overbearing and mean. He steals the boys' pocket money, clothes his son in their best suits, half starves them, and teaches them next to nothing. Ultimately he is transported for theft. Mrs. Squeers, a raw-boned, harsh, heartless virago, with no womanly feeling for the boys put under her charge. Miss Fanny Squeers, daughter of the schoolmaster. Miss Fanny falls in love with Nicholas Nickleby, but later hates him because he is insensible to the soft impeachment. Master Wackford Squeers, over-bearing, self-willed and passionate.

Squire of Dames.—A personage introduced by Spenser in the *Faërie Queene*, and whose curious adventures are there recorded. The expression is sometimes applied to a person devoted to the fair sex.

Steerforth (*stēr'fōrth*), **James.**—*David Copperfield*, Dickens. The young man who led little Em'ly astray. When tired of his toy, he proposed to her to marry his valet. Steerforth, being shipwrecked off the coast of Yarmouth, Ham Peggotty tried to rescue him, but both were drowned.

Stentor (*sten'tor*).—A Grecian herald in the Trojan war whom Homer describes as great-hearted, brazen-voiced Stentor, accustomed to shout as loud as fifty other men.

Stephano (*stef'a-nō*).—(1) In Tasso's *Jerusalem Delivered*, earl of Carnuti, the leader of four hundred men in the allied Christian army. He was noted for his military prowess and wise counsel; (2) a drunken butler in Shakespeare's *The Tempest;* (3) servant to Portia in Shakespeare's *Merchant of Venice*.

Stiggins, Rev. Mr.—A red-nosed, hypocritical "shepherd" or Methodist parson in Dickens' *Pickwick Papers*, with a great appetite for pineapple rum. He is the spiritual adviser of Mrs. Weller, and lectures on temperance.

Strephon (*stref'on*).—The shepherd in Sir Philip Sidney's *Arcadia*, who makes love to the beautiful Urania. It is a stock name for a lover. Chloe being usually the corresponding lady.

Strongback.—One of the seven attendants of Fortunio, in D'Aulnoy's *Fairy Tales*. He could never be overweighted, and could fell a forest in a few hours without fatigue.

Summer, St. Martin's.—The fine weather which generally occurs in October and November; referred to in *Henry VI.*

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Tabard (*tab'ärd*), **The.**—Is the inn, in High Street, Southwark, London, from which Chaucer makes his pilgrims start on their journey to Canterbury. It took its name from its sign—a tabard.

Tale of Two Cities, A.—A novel, by Charles Dickens, originally produced in *All the Year Round* for 1859, and afterward republished in complete form. The author says he first conceived the main idea of the story when acting, with his children and friends, in Wilkie Collins' drama of *The Frozen Deep*. His narrative is drawn from the scenes of the French revolution of 1789; and it was one of Dickens' hopes, he says, to add something to the popular and picturesque means of understanding that terrible time: "though no one," he continues, "can hope to add anything to the philosophy of Carlyle's wonderful book."

Tales of a Wayside Inn.—Name given by Longfellow to a collection of short poems arranged by himself and collected together much in the same form as Chaucer's *Canterbury Tales*. These "tales" were mostly gathered from old literature and translated into Longfellow's own verses—only one, *The Birds of Killingworth*, being said to be entirely original. Seven narratives are represented: the Landlord, the Student, the Spanish Cavalier, the Jew, the Sicilian, the Musician, and the Theologian. Four colonial tales are included in the work: *Paul Revere's Ride*, *Elizabeth*, *Lady Wentworth*, and *The Rhyme of Sir Christopher*.

Taming of the Shrew, The.—A comedy by Shakespeare. The incident of Vincentio's personation by the pedant was borrowed by Shakespeare from George Gascoigne's *Supposes*. The chief characters are Petruchio and his wife Katharine, the shrew.

Tam O'Shanter.—The title of a poem by Burns, and the name of its hero, a farmer, who, riding home very late and very drunk from Ayr, in a stormy night, had to pass by the kirk of Alloway, a place reputed to be a favorite haunt of the devil and his friends and emissaries. On approaching the kirk, he perceived a light gleaming through the windows; but, having got courageously drunk, he ventured on till he could look into the edifice, when he saw a dance of witches. His presence became known, and in an instant all was dark; and Tam, recollecting himself, turned and spurred his horse to the top of her speed, chased by the whole fiendish crew. It is a current belief that witches, or any evil spirits, have no power to follow a poor wight any farther than the middle of the next running stream. Fortunately for Tam, the River Doon was near, and he escaped, while the witches laid only the tail of his mare Maggie. It has been said of *Tam O'Shanter* that in no other poem of the same length can there be found so much brilliant description, pathos, and quaint humor, nor such a combination of the terrific and the ludicrous.

Tancred (*tang'kred*).—In Tasso's *Jerusalem Delivered*, was the greatest of all the Christian warriors, except Rinaldo.

Tartuffe, or Tartuffe (*tär-tüf'*).—One of Molière's best known comedies. Tartuffe is a religious hypocrite and impostor, who uses "religion" as the means of gaining money, covering deceit, and promoting self-indulgence. He is taken up by one Orgon, a man of property, who promises him his daughter in marriage; but, his true character being exposed, he is not only turned out of the house, but is lodged in jail for felony.

Isaac Bickerstaff adapted Molière's comedy to the English stage, under the title of *The Hypocrite*. Tartuffe he calls "Dr. Cantwell," and Orgon "Sir John Lambert." It is thought that "Tartuffe" is a caricature of Père la Chaise, the confessor of Louis XIV., who was very fond of truffles (French, *truffes*), and that this suggested the name to the dramatist.

Task, The.—A poem by William Cowper. "*The Task*," says Southey, "was at once descriptive, moral, and and satirical. The descriptive parts everywhere bore evidence of a thoughtful mind and a gentle spirit, as well as of an observant eye; and the moral sentiment which pervaded them gave a charm in which descriptive poetry is often found wanting. The best didactic poems, when compared with *The Task*, are like formal gardens in comparison with woodland scenery." "*The Task*," says Hazlitt, "has fewer blemishes than *The Seasons*; but it has not the same capital excellence, the 'unsought grace' of poetry, the power of moving and infusing the warmth of the author's mind into that of the reader."

Teazle (*te'zl*), **Lady.**—The heroine of Sheridan's comedy *The School for Scandal*, and the wife of Sir Peter Teazle, an old gentleman who marries late in life. She is represented as being "a lively and innocent, though imprudent, country girl, transplanted into the midst of all that can bewilder and endanger her, but with enough of purity about her to keep the blight of the world from settling upon her."

Teazle, Sir Peter.—A character in Sheridan's play *The School for Scandal*, husband of Lady Teazle.

Télémaque (*tā-lā-mak'*), **Les Aventures de:** "*Adventures of Telemachus*".—A romance by Fenelon, published in 1699. It is founded on the legendary history of Telemachus, and is one of the classics of French literature. Though the beautiful fiction of *Telemachus*, which has much in common with, and was doubtless suggested to Fenelon by the *Aeneid*, be rather an epic poem in prose than a romance, it seems to have led the way to several political romances, or, at least, to have nourished a taste for this species of composition.

Tell, William.—Title of a drama by Schiller. The hero is chief of the confederates of the forest cantons of Switzerland, and son-in-law of Walter Fürst. Having refused to salute the Austrian cap which Gessler, the Austrian governor, had set up in the market-place of Altorf, he was condemned to shoot an apple from the head of his own son. He succeeded in this perilous task, but, letting fall a concealed arrow, was asked by Gessler with what object he had secreted it. "To kill thee, tyrant," he replied, "if I had failed." The governor now ordered him to be carried in chains across the Lake Lucerne to Küssnacht Castle, "there to be devoured alive by reptiles"; but, a violent storm having arisen on the lake, he was unchained, that he might take the helm. Gessler was on board; and, when the vessel neared the castle, Tell leaped ashore, gave the boat a push into the lake, and shot the governor. After this he liberated his country from the Austrian yoke.

Tempest, The.—One of Shakespeare's fairy plays. The story runs: Prospero, duke of Milan, was dethroned by his brother Antonio, and left on the open sea with his three-year-old daughter Miranda, in "a rotten carcass of a boat." In this they were carried to an enchanted island, uninhabited except by a hideous creature, Caliban, the son of a witch. Prospero was a powerful enchanter, and soon had not only Caliban, but all the spirits of the region under his control, including Ariel, chief of the spirits of the air. Years afterward Antonio, Alfonso, Sebastian and other friends of the usurper came near the island. Prospero, by his magic, raises a storm which casts their ship on the shore and the whole party are spellbound and brought to Prospero. Plots and counterplots follow, bringing in Caliban and clowns; but all are made ridiculous and are defeated by Prospero and Ariel.

Tessa (*tes'ä*).—In George Eliot's novel of *Romola* is the peasant girl who is deceived into marriage with Tito Melema.

Thangbrand.—*Tales of a Wayside Inn*, Henry W. Longfellow. King Olaf's drunken priest, "stout of stature, large of limb," who was sent to Iceland, found the people poring over their books, and sailed backward to Norway to say to Olaf "little hope is there of these Iceland men."

Theagenes (*thē-aj'e-nēz*) **and Chariclea** (*kar-i-klē'ä*).—The chief characters in a Greek love story, by Heliodorus, bishop of Trikka, fourth century. A charming fiction, largely borrowed from by subsequent novelists, and especially by Mdlle. de Scudéri, Tasso, Guarini, and D'Urfé.

Thekla.—The daughter of Wallenstein in Schiller's drama of this name. She is an invention of the poet.

Theodorus.—The name of a physician, in Rabelais' romance of *Gargantua*. At the request of Pantagruel, Gargantua's tutor, he undertook to cure the latter of his vicious manner of living, and accordingly "purged him canonically with Anticyrian hellebore," by which medicine he cleared out all the perverse habits of his brain, so that he became a man of honor, sense, courage, and piety.

Theresa, or Teresa (*te-rē'sä*, or *tā-rā'sä*).—Daughter of the count palatine of Padolia, beloved by Mazeppa, in Byron's *Mazeppa*.

Thersites (*ther-sī'tēz*).—A scurrilous Grecian chief, loquacious, loud and coarse, in the *Iliad*. His chief delight was to inveigh against the kings of Greece. He squinted, halted, and on his tapering head grew a few white patches of starveling down.

Thopas, Sir.—In the *Canterbury Tales*, a capital sportsman, archer, wrestler, and runner, who resolved to marry no one but an "elf queen," and accordingly started for Faëryland. Story left unfinished.

Thorberg Skafting.—*Tales of a Wayside Inn*, Henry W. Longfellow. The master-builder ordered by King Olaf to build a ship twice as long and twice as large as the *Dragon*, built by Raud the Strong, which was stranded.

Three Musketeers [*Trois Mousquetaires* (*trwä mōs-ke-tar'*), *Les*].—A novel by Alexander Dumas *père*, published in 1844. The scene is laid in the time of Richelieu. The three musketeers are Athos, Porthos, and Aramis, but D'Artagnan is the principal character. He is a young Gascon of an adventurous yet practical nature, with a genius for intrigue, who goes up to Paris to seek his fortune with an old horse, a box of miraculous salve given to him by his mother, and his father's counsels. His career is one of hairbreadth escapes (with death, in the end, on the field of battle) in the society of the three musketeers.

Thyestean Banquet.—Referred to in Milton's *Paradise Lost*. A cannibal feast. Thyestes was given his own two sons to eat at a banquet served up to him by his brother Atreus.

Thyrsis (*ther'sis*).—A herdsman introduced inthe *Idylls* of Theocritos, and in Vergil's *Eclogues*.

> Hard by, a cottage chimney smokes
> From betwixt two aged oaks,
> Where Corydon and Thyrsis, met,
> Are at their savory dinner set.
> Milton, *L'Allegro*.

Timias.—King Arthur's squire in Spenser's *Faërie Queene*. He went after the "wicked foster," from whom Florimel fled, and the "foster" with his two brothers, falling on him, were all slain.

Tobey, Uncle.—A character in Sterne's *Tristram Shandy*. A captain who was wounded at the siege of Namur, and was obliged to retire from the service. He is the impersonation of kindness, benevolence, and simple-heartedness; his courage is undoubted, and his gallantry delightful for its innocence and modesty.

Tommy Atkins.—*Barrack-Room Ballads*, Kipling. The name is here used in its general meaning, a British soldier. The name came from the little pocket ledgers served out, at one time, to all British soldiers. In these manuals were to be entered the name, the age, the date of enlistment, etc. The war office sent with each little book a form for filling it in, and the hypothetical name selected was *Tommy Atkins*. The books were instantly so called, and it did not require many days to transfer the name from the book to the soldier.

Tom Sawyer, Adventures of.—By Mark Twain. An "elastic" youth whose performances delight both old and young readers. Queer enterprises, influenced by the old superstitions among slaves and children in the Western states give reliable pictures of boy-life in the middle of the nineteenth century.

Topsy.—*Uncle Tom's Cabin*, Mrs. Stowe. A young slave-girl, who never knew whether she had either father or mother, and being asked by Miss Ophelia St. Clare how she supposed she came into the world, replied, "I 'spects I growed."

Touchstone (*tuch'stōn*).—A clown in Shakespeare's *As You Like It*. His seven degrees of the lie are: (1) The retort courteous, (2) the quip modest, (3) the reply churlish, (4) the reproof valiant, (5) the countercheck quarrelsome, (6) the lie circumstantial, (7) the lie direct.

Townley Mysteries.—Certain religious dramas; so called because the MS. containing them belonged to P. Townley. These dramas are supposed to have been acted at Widkirk abbey, in Yorkshire.

Tranio (*trā'ni-ō*).—In Shakespeare's *Taming of the Shrew*, one of the servants of Lucentio, the gentleman who marries Bianca, sister of Katharina "the Paduan shrew."

Triads.—Three subjects, more or less connected, formed into one continuous poem or subject; thus the "Creation, Redemption, and Resurrection" would form a triad.

Trim, Corporal.—Uncle Toby's attendant, in Sterne's novel, *The Life and Opinions of Tristram Shandy, Gent*, distinguished for his fidelity and affection, his respectfulness, and his volubility.

Tristram (*tris'tram*), **Sir.**—One of the most celebrated heroes of mediæval romance. His adventures form an episode in the history of Arthur's court, and are related by Thomas the Rhymer, as well as by many romancists.

Tubal (*tū'bal*).—A wealthy Jew, the friend of Shylock, in Shakespeare's *The Merchant of Venice*.

Tuck, Friar.—*Ivanhoe*, Scott. The father-confessor of Robin Hood and connected with Fountain's Abbey. He is represented as a clerical Falstaff, very fat and self-indulgent, very humorous, and somewhat coarse. His dress was a russet habit of the Franciscan order. He was sometimes girt with a rope of rushes. Friar Tuck also appears in the "morris dance" on Mayday.

Turveydrop.—*Bleak House*, Dickens. A conceited dancing-master, who imposes on the world by his majestic appearance and elaborate toilette. He is represented as living upon the earnings of his son, who has a most slavish reverence for him as a perfect "master of deportment."

Tutivillus (*tū-ti-vil'us*).—In Langland's *Visions of Piers Plowman*, the demon who collects all the fragments of words omitted, mutilated, or mispronounced by priests in the performance of religious services, and stores them up in that "bottomless" pit which is "paved with good intentions."

Tweedledum and Tweedledee.—The prince of Wales was the leader of the Handel party, supported by Pope and Dr. Arbuthnot; and the duke of Marlborough led the Bononcinists, and was supported by most of the nobility.

Twelfth Night.—A drama by Shakespeare. The story is said to have come from a novelette written early in the sixteenth century. A brother and sister, twins, are shipwrecked. Viola, dressed like her brother, becomes page to the duke Orsino. The duke was in love with Olivia, and, as the lady looked coldly on his suit, he sent Viola to advance it; but the willful Olivia, instead of melting toward the duke, fell in love with his beautiful page. Sebastian, the twin-brother of Viola, was attacked in a street brawl before Olivia, and, thinking him to be the page, she invited him in. The result was the marriage of Sebastian to Olivia, and of the duke to Viola.

Twice-Told Tales.—A collection of tales by Nathaniel Hawthorne, some of which had been already published in the *Token*, and other periodicals. They are mystical and, though in prose form, are the work of a poet. The tales are nearly all American in subject, but are treated from the spiritual rather than the practical side.

Two Gentlemen of Verona (*vā-rō'nä*).—A drama by Shakespeare, the story of which is taken from the *Diana* of Montemayor (sixteenth century). The plot resembles that of *Twelfth Night*, as Julia, disguised as a page, is a prominent figure.

U

Uarda (*ō-är'dä*).—A novel by Ebers, published in 1877. The scene is laid chiefly in Egypt at the time of the reign of Rameses II.

Ubaldo.—*Jerusalem Delivered*, Tasso. One of the older crusaders, who had visited many regions. He and Charles the Dane went to bring back Rinaldo from the enchanted castle.

Ubeda.—*Don Quixote*, Cervantes. A noted artist who one day painted a picture, but was obliged to write under it, "This is a cock," in order that the spectator might know what was intended to be represented.

Thule (*thū'lē*).—"*Ultima Thule*." The extremity of the world; the most northern point known to the ancient Romans. Pliny and others say it is Iceland.

Una (*ū'nä*).—*Faërie Queene*, Spenser. The personification of truth. She goes, leading a lamb and riding on a white ass, to the court of Gloriana, to crave that one of her knights might undertake to slay the dragon which kept her father and mother prisoners. The adventure is accorded to the Red Cross Knight. Being driven by a storm into Wandering Wood, a vision is sent to the knight which causes him to leave Una, and she goes in search of him. In her wanderings a lion becomes her attendant. After many adventures, she finds St. George, "the Red Cross Knight," but he is severely wounded. Una takes him to the House of Holiness, where he is carefully nursed, and then leads him to Eden.

Uncle Tom's Cabin.—A work of fiction by Mrs. Harriet Beecher Stowe. It had an enormous sale, and at once made the author famous. As a picture of slave life as it once obtained in the Southern states of America it is certainly unsurpassed. The scenes described in it are so terrible that Mrs. Stowe deemed it advisable to publish in 1853 a *Key* to the work, showing the large extent to which it is founded upon fact. The hero is, of course, Uncle Tom.

Uncle Tom was an old negro slave of unaffected piety, and most faithful in the discharge of all his duties. His master, a humane man, becomes em-

barrassed in his affairs, and sells him to a slave-dealer. After passing through various hands, and suffering intolerable cruelties, he dies. The figure next in interest is Legree, the brutal slave-owner. Everyone, also, will remember Eva and Topsy.

Urganda (*ŏr-găn'dă*).—In the romance of *Amadis de Gaul*, a powerful fairy sometimes appearing in all the terrors of an evil enchantress.

Uriel (*ū'ri-el*), or **Israfil.**—In the *Koran*, the angel who is to sound the resurrection trumpet. Longfellow, in *The Golden Legend*, calls him "the minister of Mars," and says that he inspires man with "fortitude to bear the brunt and suffering of life."

Uther (*ū'ther*).—Son of Constans, one of the fabulous or legendary kings of Britain, and the father of Arthur.

Utopia (*ū-tō'pi-ă*).—The name of an imaginary island described in the celebrated work of Sir Thomas More, in which was found the utmost perfection in laws, politics, and social arrangements. More's romance obtained a wide popularity, and the epithet *Utopian* has since been applied to schemes for the improvement of society which are deemed not practicable.

Uzziel.—In *Paridise Lost*, the next in command to Gabriel. The word means "God's strength."

V

Valentine (*val'en-tīn*).—(1) One of the heroes in the old romance of *Valentine and Orson*. (2) One of the *Two Gentlemen of Verona*, by Shakespeare. (3) A gentleman attending on the duke in Shakespeare's *Twelfth Night*. (4) One of the characters in Goethe's *Faust*. He is a brother of Margaret.

Valerian (*va-lē'ri-an*).—*Canterbury Tales*, Chaucer. The husband of St. Cecilia. Cecilia told him she was beloved by an angel, who constantly visited her; and Valerian requested to see this visitant. Cecilia replied that he could do so if he went to Pope Urban to be baptized. This he did, and on returning home the angel gave him a crown of lilies, and to Cecilia a crown of roses, both from the garden of paradise.

Valley of Humiliation.—*Pilgrim's Progress*, Bunyan. The place where Christian encountered Apollyon, just before he came to the "Valley of the Shadow of Death."

Vanity Fair.—A novel without a hero, by Thackeray. "There are scenes of all sorts," says the author in his preface to the work, "some dreadful combats, some grand and lofty horse-riding, some scenes of high life and some of very middling indeed, some love making for the sentimental, and some light comic business; the whole accompanied by appropriate scenery, and brilliantly illuminated by the author's own candle."

Vathek (*vath'ek*).—By Beckford. Originally written in French. "It was composed," says the author, "at twenty-two years of age. It took me three days and two nights of hard labor. I never took off my clothes the whole time." The description of the Hall of Eblis, which is often quoted, was taken, it appears, from the old hall at Fonthill, Beckford's residence, probably the largest in any private house in England. "It was from that hall I worked, magnifying and coloring it with Eastern character. All the female characters were portraits drawn from the domestic establishment of old Fonthill, their good or evil qualities ideally exaggerated to suit my purpose." *Vathek* was translated into English, it is not known by whom, immediately on its appearance. "It was one of the tales," says Byron, "I had a very early admiration of. For correctness of costume, beauty of description, and power of imagination, it far surpasses all European imitations, and bears such marks of originality that those who have visited the East will find some difficulty in believing it to be more than a translation."

Veck, Toby.—*The Chimes*, Dickens. A ticket-porter who went on errands and bore the nickname Trotty. One New Year's eve he had a nightmare and fancied he had mounted to the steeple of a neighboring church, and that goblins issued out of the bells. He was roused from his sleep by the sound of the bells ringing in the new year.

Veiled Prophet.—*Lalla Rookh*, Moore. He assumed to be a god, and maintained that he had been Adam, Noah, and other representative men. Having lost an eye, and being otherwise disfigured in battle, he wore a veil to conceal his face, but his followers said it was done to screen his dazzling brightness.

Vernon, Di, or **Diana.**—*Rob Roy*, Scott. The heroine of the story, a high-born girl of great beauty and talents. She is an enthusiastic adherent to a persecuted religion and an exiled king.

Vicar of Wakefield.—A novel by Goldsmith. The hero is Dr. Primrose, a simple-minded, pious clergyman, with six children. He begins life with a good fortune, a handsome house, and wealthy friends, but is reduced to poverty without any fault of his own, and, being reduced like Job, like Job he is restored.

Vincentio (*vin-sen'shiō*).—The duke of Vienna in Shakespeare's *Measure for Measure*. He commits his scepter to Angelo, under the pretext of being called to take an urgent and distant journey, and by exchanging the royal purple for a monk's hood, observes incognito the condition of his people.

Vincy (*vin'si*), **Rosamond.**—One of the principal female characters in George Eliot's novel *Middlemarch*.

Viola. (*vī'ō-lă*) —*Twelfth Night*, Shakespeare. A sister of Sebastian. They were twins, and so much alike that they could be distinguished only by their dress. When they were shipwrecked Viola was brought to shore by the captain, but her brother was left to shift for himself. Being in a strange land, Viola dressed as a page, and, under the name of Cesario, entered the service of Orsino, duke of Illyria. The duke greatly liked his beautiful page, and, when he discovered her true sex, married her.

Violenta.—*All's Well That Ends Well*, Shakespeare. A character in the play who enters upon the scene only once, and then she neither speaks nor is spoken to. The name has been used to designate any young lady nonentity; one who contributes nothing to the amusement or conversation of a party.

Virgilia (*ver-jil'i-ă*).—In Shakespeare's *Coriolanus*, was the wife of Coriolanus, and Volumnia his mother; but historically Volumnia was his wife and Veturia his mother.

Virginia (*ver-jin'i-ă*).—A young Roman plebeian of great beauty, decoyed by Appius Claudius, one of the decemvirs, and claimed as his slave. Her father, Virginius, being told of it, hastened to the forum, and arrived at the moment when Virginia was about to be delivered up to Appius. He seized a butcher's knife, stabbed his daughter to the heart, rushed from the forum, and raised a revolt. This has been the subject of a host of tragedies. It is one of Lord Macauley's lays (1842), supposed to be sung in the forum on the day when Sextus and Licinus were elected tribunes for the fifth time.

Vivian (*viv'i-an*), or **Viviane,** or **Vivien.**—In the Arthurian cycle of romance, an enchantress, the mistress of Merlin. She brought up Lancelot in her palace, which was situated in the midst of a magical lake; hence her name "the Lady of the Lake."

Volpone (*vol-pō'ne*), or the *Fox*.—A comedy by Ben Jonson, written in 1605. Hazlitt calls it his best play; prolix and improbable, but intense and powerful. It seems formed on the model of Plautus in unity of plot and interest. The principal character is represented as a wealthy sensualist, who tests the character of his friends and kinsmen by a variety of strategems, obtains from them a large addition to his riches by the success of his impostures, and finally falls under the vengeance of the law. "*Volpone*," says Campbell, "is not, like the common misers of comedy, a mere money-loving dotard, a hard, shriveled old mummy, with no other spice than his avarice to preserve him—he is a happy villain, a jolly misanthrope, a little god in his own selfishness; and Mosca is his priest and prophet. Vigorous and healthy, though past the prime of life, he hugs himself in his harsh humor, his successful knavery and imposture, his sensuality and his wealth, with an unhallowed relish of selfish existence."

W

Wallenstein (*văl'len-stīn*).—A trilogy by Schiller, comprising *Wallenstein's Lager*, *Die Piccolomini*, and *Wallenstein's Tod*. Schiller conceives his hero in these dramas as the type of the practical realist, serious, solitary, and reserved.

Wandering Jew, The—(F. *Le Juif Errant*).—A novel by Eugene Sue. The chief character is an imaginary person in a legend connected with the history of Christ's passion. As the Savior was on the way to the place of execution, overcome with the weight of the cross, he wished to rest on a stone before the house of a Jew, who drove him away with curses. Driven by fear and remorse, he has since wandered, according to the command of the Lord, from place to place, and has never yet been able to find a grave.

War and Peace.—An historical novel by Tolstoi, published 1865-1868. The scene is laid in the time of the Czar Alexander I., and the novel is a picture of Russian society during the Russo-French wars.

Waverley (*wā'ver-li*) **Novels.**—General name given to Scott's historical novels.

Wayside Inn, Tales of a.—Poems in various meters by Henry Wadsworth Longfellow. The first series includes a Prelude (*The Wayside Inn*), the Landlord's

Tale (*Paul Revere's Ride*), the Student's Tale (*The Falcon of Ser Federigo*), the Spanish Jew's Tale (*The Legend of Rabbi Ben Levi*), the Sicilian's Tale (*King Robert of Sicily*), the Musician's Tale (*The Saga of King Olaf*), the Theologian's Tale (*Torquemada*), the Poet's Tale (*The Birds of Killingworth*), several Interludes, and Finale.

Weller (*wel'er*), **Sam.**—In Dickens' celebrated *Pickwick Papers*. A servant to Mr. Pickwick, to whom he becomes devotedly attached. Rather than leave his master when he is sent to the Fleet, Sam Weller gets his father to arrest him for debt. He is an inimitable compound of wit, simplicity, quaint humor, and fidelity. Tony Weller, father of Sam; a coachman of the old school, who drives between London and Dorking. On the coachbox he is a king, elsewhere a mere London "cabby." He marries a widow, and his constant advice to his son is, "Sam, beware of the vidders."

Westward Ho!—A novel by Charles Kingsley, the scene of which is laid in "the spacious times of great Elizabeth," when the safety of England was threatened by the Spanish armada. Several historical personages figure in the story, such as Sir Walter Raleigh, Sir Richard Grenville, Admiral Hawkins, and Sir Francis Drake; and the narrative carries the reader from Bideford to London, and from thence to Ireland, to the Spanish main, and the South American continent, back again to Bideford and Plymouth, whence the hero, Amyas Leigh, sails to take part in the famous sea-fight.

Wild (*wīld*), **Jonathan.**—A cool, calculating, heartless villain, with the voice of a Stentor, hero of Defoe's romance of the same name.

Wilford.—(1) In Knowles' *The Hunchback*, supposed to be earl of Rochdale. (2) In Knowles' *The Beggar of Bethnal Green*, the truant son of Lord Woodville, who fell in love with Bess, the daughter of the "blind beggar of Bethnal Green."

Wilhelm Meister (*vil'helm mīs'ter*).—Title of a philosophic novel by Goethe. The object is to show that man, despite his errors and shortcomings, is led by a guiding hand, and reaches some higher aim at last. This is considered to be the first true German novel.

Wimble (*wim'bl*), **Will.**—A member of the fictitious *Spectator Club*, said to be intended as a portrait of a Mr. Thomas Morecroft, a gentleman of simple habits and good nature.

Winter's Tale, The.—A play by Shakespeare. Leontês, King of Sicily, invites his friend Polixenês to visit him, becomes jealous, and commands Camillo to poison him. Camillo warns Polixenês, and flees with him to Bohemia. Leontês casts his queen, Hermionê, into prison, where she gives birth to a daughter. Hermoinê is reported dead and the child is brought up by a shepherd, who calls it Perdita. Florizel sees Perdita and falls in love with her; but Polixenês, his father, tells her that she and the shepherd shall be put to death if she encourages the suit. Florizel and Perdita flee to Sicily, and being introduced to Leontês, it is soon discovered that Perdita is his lost daughter. Polixenês tracks his son to Sicily, and consents to the union. The party are invited to inspect a statue of Hermionê, and the statue turns out to be the living queen.

Worldly-Wiseman, Mr.—One of the characters in Bunyan's *Pilgrim's Progress*, who converses with Christian by the way, and endeavors to deter him from proceeding on his journey.

Wrayburn (*rā'bern*) **Eugene.**—*Our Mutual Friend*, Dickens. Barrister-at-law; an indolent, moody, whimsical young man, who loves Lizzie Hexam. After he is nearly killed by Bradley Headstone, he reforms and marries Lizzie, who saved his life.

Y

Yahoo (*yā-hō'*).—A name given by Swift, in his satirical romance of *Gulliver's Travels*, to one of a race of brutes having the form and all the vices of man. The Yahoos are represented as being subject to the Houyhnhnms, or horses endowed with reason.

Yorick (*yor'ik*).—(1) The King of Denmark's jester, mentioned in Shakespeare's *Hamlet*. Hamlet picks up his skull in the churchyard and apostrophizes it. (2) A humorous and careless parson in Sterne's *Tristram Shandy*.

Z

Zadig.—The title of a novel by Voltaire. Zadig is a wealthy young Babylonian, and the object of the novel is to show that the events of life are beyond human control.

Zanoni (*za-nō'ni*).—Hero of a novel, so-called, by Lord Lytton. Zanoni is supposed to possess the power of communicating with spirits, prolonging life, and producing gold, silver, and precious stones.

Zara (*zā'rā;* French, *zaire*), a tragedy by Voltaire. Zara is the daughter of Lusignan d Outremer, king of Jerusalem and brother of Nerestan. For twenty years Lusignan and his two children were captives at the court of the sultan Osman. The latter loves Zara, and was jealous of Nerestan, of whose relationship he was ignorant, and stabbed her to the heart. Nerestan being brought before the sultan, told him he had slain his sister. Osman then stabbed himself out of remorse.

Zenobia (*ze-nō'bi-ä*).—*Blithedale Romance*, Hawthorne. A strong-minded woman, beautiful and intelligent, who was interested in playing out the pastoral of the life at Brook Farm. She is represented as disappointed in love, and at last she drowned herself.

Zephon.—A "strong and subtle spirit" in Milton's *Paradise Lost*, whom Gabriel dispatched with Ithuriel to find Satan.

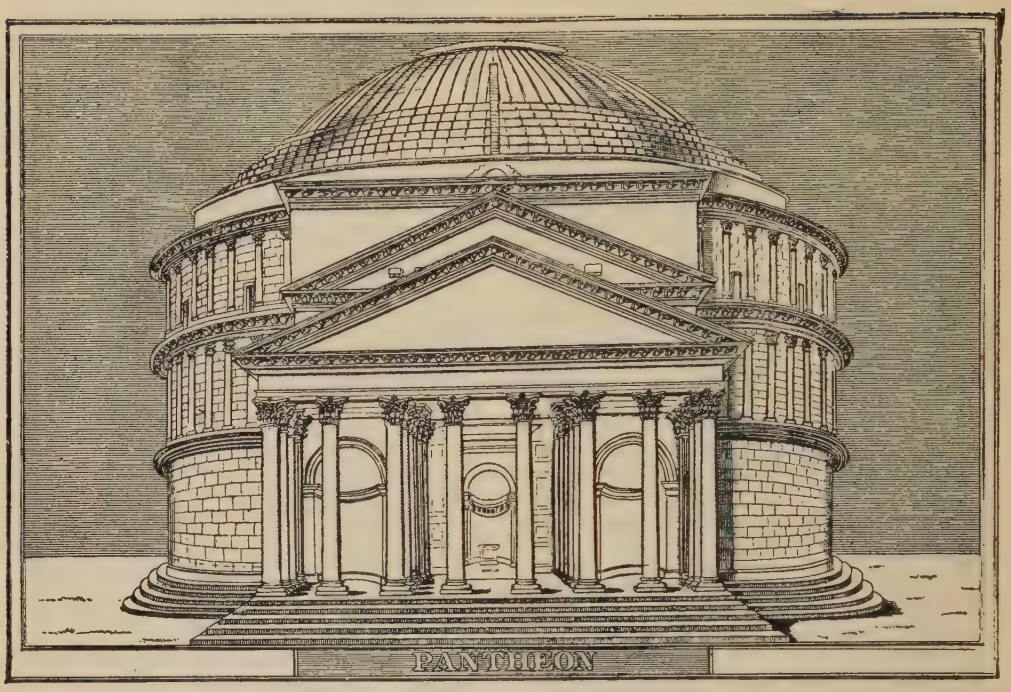
Zillah.—One of Southey's characters, beloved by Hamuel, a brutish sot. Zillah rejected his suit, and Hamuel vowed vengeance. Accordingly, he gave out that Zillah had intercourse with the devil, and she was condemned to be burnt alive. God averted the flames, which consumed Hamuel; but Zillah stood unharmed, and the stake to which she was bound threw forth white roses, "the first ever seen on earth since paradise was lost."

Zimri (*zim'ri*).—In Dryden's *Absalom and Achitophel*, is intended for George Villiers, duke of Buckingham, who had satirized Dryden in *The Rehearsal* as Bayes.

Zophiel (*zō'fi-el*).—In Milton's *Paradise Lost*, an angelic scout.

Zuleika (*zū-lē'kä*).—The heroine in Byron's poem of *The Bride of Abydos*, in love with Selim:

"Fair, as the first that fell of womankind . . .
Soft, as the memory of buried love;
Pure, as the prayer which childhood wafts above:
Such was Zuleika—such around her shone
The nameless charms unmark'd by her alone:
The light of love, the purity of grace,
The mind, the music breathing from her face,
The heart whose softness harmonized the whole—
And, oh! that eye was in itself a soul!"



This beautiful Roman temple, said to have been erected by Agrippa in 27 B. C., was dedicated to all the gods of Greece and Rome. It is lighted by a single aperture in the center of its magnificent dome. (See illustration on next page.)

GODS, HEROES AND MYTHICAL WONDER TALES

A myth is a story told about gods or heroes. Mythology is a term applied to the collected myths of a nation or people, sometimes to the scientific study of myths. The first to busy itself in a large sense with mythology was the Greeks, whose myths had the most luxuriant and fanciful development. When the Romans received the arts and sciences from the Greeks, they adopted also their gods and their entire religious system. Thus it was that the Greek and Roman mythologies were to a great extent the same.

THE IMPORTANCE OF MYTHOLOGY IN EDUCATION

On account of their great beauty and universal interest, myths were made the themes of poets, priests, artists and commentators alike. Not only were the myths the inspiration of classical literature, art and religion, but they kept their place in later civilizations, and mythological allusions are so frequent in our own literature that an acquaintance with classic fable is a necessary part of modern education.

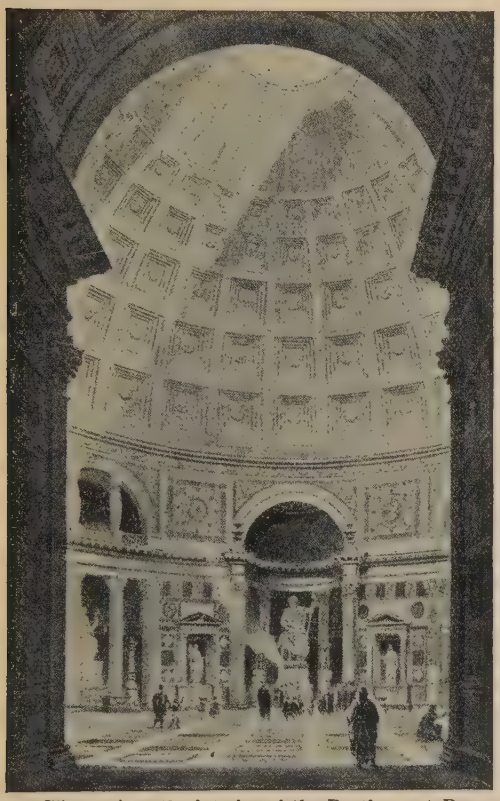
HOW THE MYTHS ORIGINATED

A large proportion of these myths are due to men's observations of Nature, and her various active and creative forces, which appeared to their lively Southern fancy as manifestations of single supernatural beings. These were regarded now as friendly, now as hostile, to man; and men therefore strove as eagerly to gain their favor as to appease their wrath. Of the appearance of the deities who thus manifested themselves in the workings of nature, men necessarily formed at first very crude and fantastic ideas. But later, when men emerged from the simple conditions of the early patriarchal epoch, and began to dwell in regular political communities, they gradually ceased to regard the gods as mere personifications of natural forces. They began to regard them as beings acting in accordance with unchangeable moral laws, and endowed with forms similar to those of men. They brought the gods into connection with each other by means of genealogies in a great measure artificial, and built up a vast political system, which has its center in Zeus, or Jupiter, the "father of gods and men." (See Chart on following pages.)

HOW THE GODS RESEMBLE MORTALS

The ancient Greeks believed their gods to be of the same shape and form as themselves, but of far greater beauty, strength, and dignity. They also regarded them as being of much larger size than men; for in those times great size was esteemed a perfection, supposed to be an attribute of divinities, to whom they ascribed all perfections. A fluid named ichor supplied the place of blood in the veins of the gods. They were immortal, but they might be wounded or otherwise injured. They could make them-

selves visible or invisible to men, and assume the forms of men or of animals. Like men they stood in daily need of food and sleep. The meat of the gods was called ambrosia, their drink nectar. The gods, when they came among men, often partook of their food and hospitality.



Glimpse into the interior of the Pantheon at Rome showing statues of the gods and the marvelous effects of lighting.

Like mankind, the gods were divided into two sexes; namely, gods and goddesses. They married and had children. Often a god became enamored of a mortal woman, or a goddess was smitten with the charms of a handsome youth, and these love tales form a large portion of Grecian mythology.

To make the resemblance between gods and men more complete, the Greeks ascribed to their deities all human passions, both good and evil. They were capable of love, friendship, gratitude, and all affections; on the other hand, they were frequently envious, jealous, and revengeful. They were particularly careful to exact all due respect and attention from mankind, whom they required to honor them with temples, prayers, costly sacrifices, splendid processions, and rich gifts; and they severely punished insult or neglect.

HOW AND WHERE THE GODS LIVED

If we look to the employment of the gods, we find that it consists chiefly in pleasant idleness; though they endeavor, like the rich among mankind, to make time fly by indulging in their favorite pastimes. They take their meals in common, and assemble for this purpose in the palace of Zeus, on the windy heights of Olympus. There they refresh themselves, while Hebe ministers to their wants, listening to the strains of Apollo's lute, and to the songs of the sweet-voiced Muses, and entertaining themselves with pleasant conversation. Not always, indeed, is the company so peaceful and pleasant. At times these great gods quarrel finely; nay, even small conspiracies arise to interrupt the uniformity of their existence, such as that of Hera, Poseidon, and Athene against Zeus during the Trojan war, which is related in the fifteenth book of the "Iliad."

RELATIONSHIP AND DOMINION OF THE GODS

Lastly, that no point in their resemblance to mankind may be omitted, all the different deities are united in one great family, of which Zeus, or Jupiter, the father of men and the ruler of the gods, is the head and center. Zeus has, however, a special dominion over the celestial deities only, those of the sea and waters being subjected to Neptune or Poseidon, and those of the lower world to Hades, or Pluto.

A PRONOUNCING DICTIONARY OF MYTHOLOGY

KEY TO PRONUNCIATION

The long (marked) vowels are pronounced as in the following words; *fāte, fāre, far; mē; mīne; mōte; mūte.* The short vowels, which include all not marked as above, are pronounced as in the following words: *pat; pet; pit; pot; put.* The accented syllable in each word is indicated by a mark placed immediately after it *(q.v.), quod vide* (L) —which see.

Abaris (*ab'a-ris*).—A mythical personage who is said to have taken no earthly food, and to have ridden on an arrow—the gift of Apollo, whose priest he was—through the air.

Absyrtus (*ab-sir'tus*).—A son of Æetes, king of Colchis, sister of Medea. (See "Medea.")

Acamas (*ak'a-mās*).—(*i*) Son of Theseus and Phædra; went with Diomedes to Troy to recover Helen.

Acantha (*ak-an'tha*).—A nymph beloved by Apollo and changed into the acanthus.

Acca Laurentia (*ak'ka law-ren'shi-a*).—The nurse of Romulus and Remus, after they had been taken from the she-wolf. (See "Romulus.")

Achates (*a-kā'tēz*).—A friend of Æneas—"*fidus Achates*" famous for his fidelity.

Acheloiades (*a-ke-lō'i-a-dēz*).—The Sirens, so called because they were the daughters of Achelous.

Achelous (*ak-el'ō-us*).—The river-god was the son of Oceanus and Tethys, and the eldest of three thousand brothers. He and Hercules both loved Deianira, and fought for the possession of her. Hercules conquered him, when he took the form of a bull, but was defeated again and deprived by Hercules of one of his horns. Achelous, who was looked upon as the representative of all fresh water, was considered a great divinity throughout Greece.

Acheron (*ak'er-ōn*).—Generally signifies the whole of the lower world. Properly, it is the river of the lower world, around which the shades of the departed hover, and into which the Cocytus and Pyriphlegethon flow. There are other rivers also named Acheron.

Achilles (*a-kill'ēz*).—The great hero of the *Iliad.* He was the son of Peleus, king of the Myrmidones, and the Nereid Thetis. His mother, wishing to make him immortal, plunged him, when an infant, into the river Styx, and succeeded with the exception of the ankles, by which she held him. He was educated by Phoenix and Chiron, the centaur—the former teaching him

eloquence and the arts of war, the latter the healing art. When he was but nine years old, Calchas declared that Troy could not be taken without his aid. His mother, knowing that this war would be fatal to him, disguised him as a girl and sent him to dwell with the daughters of Lycomedes, at whose court he was called Pyrrha (*pir'ra*), *i.e.*, red or tawny, on account of his auburn hair. Seeing, however, that Troy could not be taken without his aid, the crafty Ulysses, disguished as a merchant, sought him out, offering for sale jewels and articles of feminine attire, among which he had placed some arms. The ruse succeeded, as Achilles, by eagerly seizing the arms, at once betrayed his sex, and accompanied Ulysses to the Greek army before Troy. While at Lycomedes' court he became by Deidamia the father of Pyrrhus, or Neoptolemus. Before Troy he performed great feats of valor. After killing numbers of Trojans, he at length met Hector, whom he chased thrice round the walls of the city, and, having slain him, tied his body to his chariot and dragged it to the ships of the Greeks. He had an invulnerable suit of armor made, at his mother's request, by Vulcan. Finally, he was slain by Paris, son of Priam, who shot him in the heel, his only vulnerable part. He is the principal hero of the *Iliad*, and is represented as the handsomest and bravest of all the Greeks. After his death Achilles became one of the judges in the lower world, and dwelt in the islands of the blessed, where he was united to Medea, or Iphigenia.

Acis (*ā'sis*).—A Sicilian shepherd, beloved by the nymph Galatea. He was crushed, through jealousy, under a huge rock by Polyphemus, the Cyclop, and his blood gushing forth from under was changed by the nymph into the river Acis, at the foot of Mount Etna.

Actæon (*ak-tē'ŏn*).—A mighty huntsman, son of Aristæus and Autonoë. One day while hunting he saw Diana and her nymphs bathing, and was immediately changed by the goddess into a stag, in which form he was torn to pieces by his fifty dogs.

Admetus (*ad-mē'tus*).—King of Pheræ, in Thessaly. On the death of his first wife he sued for the hand of Alcestis, whom he obtained, by Apollo's aid, only on coming in a chariot drawn by a lion and a wild boar. The god (Apollo) tended the flocks of Admetus for nine years, when he was compelled to serve a mortal for having slain the Cyclops. Apollo prevailed on the Fates to grant that Admetus should never die if another would lay down his life for him. This Alcestis did, but was brought back from the lower world by Hercules.

Adonis (*a-dō'nis*).—A beautiful youth beloved by Venus. While hunting he was killed by a wild boar, and was changed by Venus into the anemone. The grief of Venus was so great that the gods of the nether regions allowed him to spend six months of every year with Venus upon the earth. (This myth seems to refer to the apparent death of nature in winter and its revival in spring; hence Adonis spends six months in the lower and a like period in the upper world.)

Æacus (*ē'ak-us*).—Son of Jupiter and Ægina. It is related that at his birth in the island of Ægina, which was named after his mother, there were no inhabitants on the island, and that Jupiter changed the ants there into men; hence the latter were called Myrmidones (Gr. ants), and Æacus ruled over them. Æacus was renowned throughout Greece for his justice and piety, and after his death became one of the three judges in Hades (the other two being Rhadamanthus and Minos).

Aedon (*a-ē'dŏn*).—Daughter of Pandareus and wife of Zethus, king of Thebes. Jealous of Niobe, her brother Amphion's wife, having six sons and six daughters, while she had but one son, she determined to kill the eldest of Niobe's sons, but by mistake slew her own son Itylus. Jupiter changed her into a nightingale, whose melancholy notes are represented as Ædon's lamentations for her son.

Æetes (*ē-ē'tēz*) or **Æeta** (*ē-ē'ta*).—Son of Helios (the sun) and Perséis, and king of Colchis at the time Phrixus had fled to his court on a ram with golden fleece, the gift of Mercury. (See "Phrixus.") After having sacrificed to Jupiter the ram that had carried him, Phrixus gave its golden fleece to Æetes, who suspended it to an oak tree in the grove of Mars, where it was guarded day and night by an ever-watchful dragon. It was, however, greatly coveted, and an expedition was fitted out, consisting of all the great heroes of the age, with the special object, which proved successful, of obtaining it. (See "Argonautæ.")

Ægæon (*ē-jē'ŏn*).—Son of Uranus (heaven) and Gæa (earth). Ægæon and his brothers, Gyas and Cottus, were huge monsters with a hundred arms and fifty heads. Ægæon and his brothers, who are often called the Uranids, conquered the Titans when they made war upon the gods, and secured the victory to Jupiter, who thrust the Titans into Tartarus, and placed Ægæon and his brothers to guard them. Ægæon is often referred to under the name Briareus.

Æneas (*ē-nē'as*), the hero of Virgil's great epic poem the *Æneid* (*ē-ne'id*), was the son of Anchises and Venus, and was born on Mount Ida. Having been attacked on Mount Ida by Achilles, who also drove away his flocks, he led the Dardanians against the Greeks, and at once took part in the Trojan war. Æneas and Hector were the great Trojan heroes. and the former, being beloved by gods and men, was on more than one occasion saved in battle by the gods. Venus saved him from Diomedes, and Neptune from Achilles, when the latter was on the point of killing him. From the flames of Troy he carried on his back his father, Anchises, and the household gods, and led Ascanius, his son, leaving his wife, Creusa, daughter of Priam, to follow. Æneas then set out on those wanderings that form the subject of the *Æneid*. After visiting Epirus and Sicily he was driven by a storm on the coast of Africa, where he met with Dido, queen of Carthage, who hospitably entertained him and became enamored of him. Æneas, however, left suddenly, and Dido (*q.v.*) killed herself. He then sailed to Latium, where he married Lavinia, the daughter of King Latinus, and founded the town of Lavinium, so named in honor of his wife. Turnus, to whom Lavinia had been betrothed, made war against Latinus and Æneas, but was slain by the latter, who now became ruler of the Aborigines and Trojans. Soon afterwards, however, he was slain in battle by the Rutulians.

Æolus (*ē'o-lus*).—The happy ruler of the Æolian Islands. He had been given, by Jupiter, dominion over the winds, which he kept enclosed in a mountain. When Ulysses was on his journey from Troy to Ithaca, Æolus gave him all the adverse winds in bags, but his companions, from curiosity, opened them.

Æsculapius (*ēs-kū-lā'pi-us*).—The god of healing. He was the son of Apollo and Coronis, and was brought up by Chiron, the centaur, who instructed him in the art of healing and in hunting. When he was grown up, he not only healed the sick, but recalled the dead to life. He was killed by a thunderbolt by Jupiter, who feared lest men should, by his aid, escape death altogether. Serpents were sacred to him, and the cock was sacrificed to him.

Agamemnon (*ag-a-mem'nŏn*).—King of Mycenæ, and brother of Menelaus. He married Clytemnestra, who bore him Iphigenia, Chrysothemis, Laodice (Electra) and Orestes. He was the most powerful prince in Greece. When Helen (*q.v.*) was carried off by Paris, and the Greek chiefs sought to regain her, Agamemnon was chosen commander-in-chief of the expedition. He is not, however, the hero of the *Iliad*, as he is the inferior of Achilles in true nobility of character. At the capture of Troy he received Cassandra, the daughter of Priam, as his prize. On his return home he was murdered by Ægisthus, who, during his absence at Troy, had been living with Agamemnon's wife Clytemnestra. His son Orestes avenged his father's death by slaying both Ægisthus and Clytemnestra.

Aganippe (*ag-a-nip'pē*).—A fountain at the foot of Mount Helicon, in Bœotia, sacred to the Muses, who were hence called Aganippides (*ag-a-nip'pi-dēz*).

Ajax (*ā'jaks*).—There are two heroes having this name, Ajax the Great, or Ajax Telamonius, and The Lesser Ajax, or Ajax Oïleus. (i) Ajax the Great was son of Telamon, king of Salamis, and grandson of Æacus. He took a very prominent part in the Trojan war, and was placed second to Achilles alone in bravery. He was conquered by Ulysses in struggle for the armor of Achilles, and this, according to Homer, was the cause of his death. (ii) The Lesser Ajax, or Ajax, son of Oïleus, also took part in the Trojan war. He was, next to Achilles, the most swift-footed among the Greeks.

Alcathous (*al-kath'o-us*).—Son of Pelops and Hippodamia. Obtained his wife by slaying the Cithæronian lion, which had killed the king's son, and succeeded his father-in-law as king of Megara, the walls of which he restored.

Alcestis or **Alceste** (*al-ses'tē*).—Wife of Admetus (*q.v.*).

Alcmene (*alk-mē'nē*).—Wife of Amphitryon. Jupiter, who appeared disguised as her husband, became by her the father of Hercules.

Alcyone (*al'si-on-ē*) or **Halcyone.**—Daughter of Æolus and wife of Ceyx. Her husband having perished in a shipwreck, Alcyone's grief became so intense that she threw herself into the sea. Out of compassion the gods changed the two into birds, and while these birds (halcyons) were breeding the sea always remained calm.

Alecto (*a-lek'tō*).—One of the Furies (*q.v.*).

Aloeus (*al-lō'-ūs*).—Son of Neptune and Canace. His wife had, by Neptune, two sons, Otus and Ephialtes, the Aloidæ (*a-lō'i-dē*), who were of extraordinary size

and strength. At the age of nine years they attempted to scale heaven by piling Mount Ossa upon Olympus and Pelion upon Ossa. To prevent them accomplishing this when they grew older Apollo destroyed them before their beards began to appear.

Althæa (*al-the'a*).—Wife of Œneus and mother of Meleager (*q.v.*).

Amalthea (*am-al-thē'a*).—Nurse of the infant Jupiter in Crete, whom she fed with goat's milk. Jupiter broke off one of the horns of the goat and gave it the power of becoming filled with whatever the possessor might wish; hence it was called the *cornucopia*—*i.e.*, horn of plenty.

Amazones (*a-māz'on-ēz*).—The Amazones, a mythical race of warlike women living near the river Thermodon. The female children had their right breasts cut off that they might use the bow with greater ease; hence their name *Amazon*, which means, "without breast." One of the twelve labors of Hercules was to obtain the girdle of Hippolyte, the queen of the Amazons. They came, under their queen, Penthesilea, to the assistance of Priam in the Trojan war; but she was killed by Achilles.

Amphion (*am-fī'ŏn*).—Son of Jupiter and Antiope, and twin-brother of Zethus. They were born on Mount Cithæron, and were brought up by a shepherd. Amphion received a lyre from Mercury, on which he learned to play with marvelous skill. Amphion married Niobe (*q.v.*).

Amphitrite (*am-fi-trī'tē*).—Wife of Neptune and goddess of the sea. She was the mother of Triton.

Ancæus (*an-sē'us*).—One of the Argonauts. Having left a cup of wine untasted to pursue a wild boar, he was killed by it, which gave rise to the proverb. "There's many a slip twixt the cup and the lip."

Anchises (*an-kī'sēz*).—Son of Capys and Themis, the daughter of Ilus, king of Dardanus, on Mount Ida. He was so handsome that he was beloved by Venus, who became by him the mother of Æneas. On the capture of Troy by the Greeks, he was carried off on his son's shoulders from the burning city. He set forth with Æneas for Italy, but died and was buried in Sicily.

Androgeos (*an-droj'e-ōs*).—Son of Minos and Pasiphaë. Slain at the instigation of King Ægus, after having overcome all his opponents in the Panathenæa, at Athens. To avenge his death Minos made war on the Athenians, and compelled them to send every year to Crete seven youths and seven maidens to be devoured by the Minotaur (*q.v.*). Theseus, however, slew the monster, and so delivered them from the terrible tribute.

Andromache (*an-drom'a-kē*); literal meaning, "fighting with men."—Daughter of King Eëtion and wife of Hector, by whom she had a son, Scamandrius, or Astyanax. On the taking of Troy she fell to the lot of Neoptolemus (Pyrrhus), the son of Achilles, who took her to Epirus, and treated her as his wife. She afterwards married Hector's brother Helenus.

Andromeda (*an-drom'e-da*).—Daughter of Cepheus, king of Æthiopia, and Cassiopea. Her beauty was so great that her mother boasted that she surpassed in that respect the Nereids, the marine nymphs of the Mediterranean. Consequently, Neptune sent a sea-monster to lay waste the country. The oracle of Ammon promised deliverance, on condition that Andromeda was chained to a rock and left to the fury of the monster. This was done, but she was saved by Perseus (*q.v.*), who slew the monster and obtained Andromeda for his wife. Having been previously promised to her uncle Phineus, however, the latter appeared at the wedding, and a great fight ensued in which Phineus and all associated with him were slain. After her death Andromeda was placed among the stars.

Antaeus (*an-tē'us*).—A giant of Libya (*i.e.* Africa), son of Neptune and Earth, who remained invincible so long as he touched his mother Earth. Hercules, having discovered this, held him up in the air and squeezed him to death.

Antenor (*ant-ē'nor*).—One of the wisest of the elders of Troy. When Menelaus and Ulysses came to Troy as ambassadors he received them, and advised the Trojans to give up Helen to Menelaus, which, however, they refused to do. When the city was captured by the Greeks Antenor's life was spared.

Aphrodite (*af-ro-dī'tē*)—*i.e.* sea-foam.—The goddess of love and beauty, called Aphrodite by the Greeks, because she was supposed to have been born from the sea-foam. She was called Venus by the Romans. See "Venus."

Apollo (*a-poll'ō*).—The sun-god. He was the son of Jupiter and Latona, and twin-brother of Diana. Apollo was the god of music and the fine arts, of prophecy, and the god who protects flocks and cattle. He is also represented as taking great interest in the foundation and government of cities, and was looked upon as the god who punishes; hence carrying a bow and arrows. He had a celebrated oracle at Delphi. The invention of the flute and lyre was ascribed to Apollo. He was challenged to musical contests by Marsyas and Pan (see "Marsyas" and "Midas"). Apollo, as sun-god, is frequently called Phœbus—*i.e.* the bright one. There are several statues of Apollo, the most beautiful being the Apollo Belvedere at Rome.

Arachne (*ar-ak'nē*).—A Lydian maiden who so greatly excelled in the art of weaving that she challenged Minerva to a trial of skill. Being defeated, she hanged herself, and was changed by the goddess into a spider. This fable indicates that man learned the art of weaving from the spider, and that it was first pursued in Lydia. Arachne is the Greek word for spider.

Ares (*ā'rēz*).—The Greek god of war. See "Mars."

Arethusa (*a-re-thū'sa*).—One of the Nereids or marine nymphs of the Mediterranean. She was the nymph of the celebrated fountain of Arethusa in the island of Ortygia, near Syracuse. Arethusa was being pursued by the river-god Alpheus, when she was changed by Diana into the fountain of the same name.

Argonautæ (*ar-go-naw'tē*).—The Argonauts, or sailors of the Argo, were the heroes who went with Jason on the celebrated expedition to Colchis to recover the golden fleece. The origin of the expedition was as follows: Jason's father had been deprived of his kingdom by his half-brother Pelias, who also, to make himself more secure, attempted to take the life of Jason, then an infant. The latter, was, however, saved, and given over to the care of the centaur Chiron. When he grew up Pelias promised to surrender the kingdom to him on what he considered to be an impossible condition—namely that he brought him the golden fleece. This golden fleece (for the history of which see "Phrixus") was suspended to an oak in the grove of Mars, in Colchis, and was guarded day and night by a dragon. Jason at once undertook the enterprise, and instructed Argus, son of Phrixus, to build a ship with fifty oars, which he called the Argo, from the name of the builder. Minerva herself superintended the building of the ship. In the expedition Jason was accompanied by all the great heroes of the age—Hercules, Laertes, Theseus, Ajax, etc.—to the number of fifty. After an adventurous voyage they at length arrived at their destination. Æëtes (*q.v.*), king of Colchis, on learning the object of their visit, promised to give up the golden fleece if Jason would perform the following feats: first, tame two bulls, which had brazen feet and vomited fire, and yoke them to a plow; second, sow the unused teeth of the dragon slain by Cadmus (*q.v.*), from which armed men would spring, and slay them with his own hand; third kill the dragon who guarded the fleece. Medea, daughter of Æëtes, who was well skilled in magic, enabled Jason, with whom she had fallen in love, to do all these things; and, after taking the treasure, he and his Argonauts and Medea embarked by night and sailed away. After another eventful journey they finally reached Colchis again.

Argus (*ar'gus*).—A being with a hundred eyes; hence called "Panoptes" (*pan-op'tēz*).—*i.e.* the all-seeing. Juno appointed him to watch over the cow into which Io had been changed; but Mercury, at the command of Jupiter, lulled him to sleep by playing on his flute, and then cut off his head. Juno transplanted his eyes to the tail of the peacock, her favorite bird.

Ariadne (*ar-i-ad'nē*).—Daughter of Minos and Pasiphaë. When Theseus was sent as part of the yearly tribute of seven youths and seven maidens to be devoured in the labyrinth by the Minotaur, Ariadne fell in love with him, and gave him the clue of thread, by means of which he escaped from the labyrinth. Theseus promised to marry her, and they left Crete together; but he deserted her in Naxos, where she was found by Bacchus, who made her his wife. At their marriage he gave her a crown of seven stars, which after her death was made a constellation.

Aricia (*a-rī'si-a*).—A town of Latium, sixteen miles from Rome, near which was a celebrated grove and temple of Diana.

Arion (*a-rī'on*).—A celebrated lyric poet and cithara player of Methymna, in Lesbos, about B. C. 625. Once, when returning from a successful musical contest in Sicily, the sailors, in order to possess themselves of his presents, were about to murder him, but, on his urgent entreaty, allowed him to play once more on his cithara. He then invoked the gods, and threw himself into the sea. He was not drowned, however, for one of a number of dolphins that had been attracted round the vessel by his sweet strains took him on his back and bore him safely to land.

Aristæus (*ar-is-tē'us*).—Son of Apollo and Cyrene, who is said to have taught men the management of bees, and to have first planted olive trees. He was, after his death, worshiped as a god, and regarded as the protector of flocks and shepherds, of vine and olive plantations.

Artemis (*ar'tem-is*).—The Greek name of Diana (*q. v.*).

Ascanius (*as-kā'ni-us*).—Son of Æneas and Creusa, afterwards called Iulus. He founded Alba Longa, and was succeeded on the throne by his son Silvius.

Asgard.—In Scandinavian mythology Asgard represents the city of the gods, situated at the center of the universe, and accessible only by the bridge Bifrost *i. e.*, the rainbow.

Asir.—In northern mythology the most powerful, though not the oldest, of the deities; usually reckoned as twelve gods and twelve goddesses. The gods are Odin, Thor, Baldur, Niörd, Frey, Tyr, Bragi, Heimdall, Vidar, Vali, Ullur, and Forseti; the best-known of the goddesses, Frigga, Freyja, Iduna, and Saga.

Assaracus (*as-sar'a-cus*).—King of Troy, son of Tros, father of Capys, the father of Anchises.

Astarte (*as-tar'tē*).—A powerful goddess of Syria, corresponding to the Roman Venus.

Astræa (*as-trē'a*).—Goddess of justice, daughter of Jupiter and Themis; lived during the golden age among men.

Astræus (*as-trē'us*).—A Titan, husband of Aurora (the goddess of the dawn), and father of the winds and the stars.

Astyanax (*as-tī'an-ax*)—*i. e.* lord of the city.—A name given by the people of Troy to Scamandrius (or Scamander), son of Hector and Andromache, because his father was the protector of Troy. His mother saved him from the flames at the fall of Troy, but the Greeks hurled him down from the walls.

Atalanta (*at-a-lan'ta*).—A maiden of great beauty and exceedingly swift of foot, who determined to live in celibacy. She was the daughter of Iasus and Clymene, and was exposed by her father in her infancy. She was, however, suckled by a she-bear, the symbol of Diana. She took part in the celebrated Calydonian boar hunt, and received the boar's hide from Meleager, who slew the animal. She was subsequently recognized by her father, who desired her to marry. She agreed to do so on condition that every suitor should run a race with her, and that the first that outran her should be her husband, but all those whom she beat in the race should be put to death. In this way many suitors perished; but at last came Milanion (*mī-lan'-i-on*), who, with the aid of Venus, reached the goal first, and was rewarded with her hand. The goddess gave him three golden apples, which he dropped during the race, one after the other. Attracted by their beauty, Atalanta stopped to pick them up, thus enabling Milanion to reach the goal first. "Atalanta's race" has formed the subject of several magnificent pictures.

Athamas (*ath'am-as*).—King of Orchomenus, in Bœotia. He married Nephele, who bore him Helle and Phrixus. He fell in love, however, with Ino, daughter of Cadmus, whom he married, and became by her the father of Melicertes and Learchus. As he had married Nephele at the command of Juno, he thus incurred the wrath of both Juno and Nephele, and was seized with madness. In this state he slew his son Learchus. Ino and Melicertes then leaped into the sea and became changed into marine deities, Leucothea and Palæmon respectively.

Athena (*a-thē'na*).—The great divinity of the Greeks, corresponding to the Roman Minerva (*q. v.*).

Athenæum (*a-thē-nē'um*).—A school founded by the emperor Hadrian at Rome, about A. D. 133, for the advancement of literature and philosophy. The name Athenæum means a place sacred to Minerva, who was the goddess of wisdom.

Atlas (*at'las*).—A Titan, son of Japetus and Clymene, and brother of Prometheus and Epimetheus. It is related that Perseus, after his conquest of the Gorgons, asked Atlas to shelter him, which Atlas declined to do. Whereupon Perseus, by exposing Medusa's head, changed him into the mountain Atlas (in the northwest of Africa), on which rested heaven and all the stars. Atlas married Pleione (*plē'i-ō-nē*), daughter of Oceanus, and became by her the father of the Pleiades (*plē'i-a-dēz*).

Atreus (*ā'trūs*).—Son of Pelops and Hippodamia, and brother of Thyestes. By his first wife, Cleola, he was the father of Plisthenes, and by his second—Aërope, widow of his son Plisthenes—the father of the heroes Agamemnon and Menelaus, and a daughter, Anaxibia. Atreus became king of Mycenæ. His brother, Thyestes, having seduced his wife Aërope, Atreus banished him. Thyestes then sent, from his place of exile, Atreus's son Plisthenes to slay his own father, but the converse actually took place, Atreus unwittingly killing his son. Atreus took terrible revenge on Thyestes for this. He recalled him to Mycenæ, and in a banquet placed before him the flesh of Thyestes' two sons, whom he had slain, and Thyestes unknowingly partook of the horrible repast. After the feast, Atreus produced the heads of Thyestes' sons, and convinced him of what had been done. Thyestes fled with horror, and the gods cursed Atreus and his house. The country was now visited by famine, and Atreus, following the advice of the oracle, went in search of Thyestes. In the course of his wanderings he married, as his third wife, Thyestes' daughter Pelopia, thinking she was the daughter of Thesprotus. Pelopia became, by her own father, the mother of Ægisthus, who afterwards slew his uncle, Atreus, because the latter had commanded him to kill his father, Thyestes. This tragic story forms the foundation of several Greek plays.

Atropos (*at'rop-os*).—One of the Fates or Parcæ (*q.v.*).

Atys (*ā'tis*).—A beautiful shepherd of Phrygia, beloved by Cybele (*sib'el-ē*). Having proved unfaithful, the goddess caused him to become mad, and he was changed into a fir tree.

Augeas (*aw'je-as*), or **Auglas** (*aw-jī'as*).—A king of Elis, whose stable, containing three thousand head of cattle, uncleansed for thirty years, was cleaned out in one day by Hercules (*q.v.*).

Aulis (*aw'lis*).—A harbor in Bœotia, where the Greek fleet assembled before sailing for Troy.

Aurora (*aw-ror'a*).—The goddess of the dawn, called Eos (*ē'ōz*) by the Greeks; daughter of Hyperion and Thia, wife of Tithonus. She is represented as rising, at the close of every night, from the river Oceanus, in her rose-colored chariot drawn by swift horses, and opening with her rosy fingers the gates of the East. She bore Memnon to Tithonus.

Auster (*aws'ter*); the Greek *Notus*, the southwest wind. In the winter it brought fogs and rain; but in the summer it was a harmful dry and parching wind.

Autolycus (*aw-tol'ik-us*).—A very dexterous robber, who could transform himself into various shapes. He was the son of Mercury (the god of cunning and theft) and Chione (*kī'on-ē*), and the father of Anticlea, the mother of Ulysses, who was celebrated for his cunning.

Avatar.—The incarnation or descent of the deity Vishnu, of which nine are believed to be past, and the tenth is yet to come, when Vishnu will descend from heaven on a white-winged horse, and introduce on earth a golden age of virtue and peace.

Avernus lacus (*a-ver'nus lā'kus*).—Lake Avernus. A lake near Cumæ, enclosed by steep and wooded hills, whose deadly exhalations were said to kill the birds flying over it. Near it was the cave of the Sibyl, through which Æneas (see *Æneid*, Book VI.) descended to the lower world. Sometimes Avernus is used to mean the lower world itself. In the latter sense it is used in the well-known quotation, *Facilis descensus Averno*, "The descent to hell is easy."

Azazel.—Ewald considers Azazel to have been a demon belonging to the pre-Mosaic religion. Another opinion identifies him with Satan, or the devil. Milton makes him Satan's standard bearer.

Azrael.—Meaning in Hebrew "help of God." In the Jewish and the Mohammedan mythology, the name of an angel who watches over the dying, and separates the soul from the body.

B

Baal.—A sun god, the center of whose worship was Phœnicia, whence it spread to neighboring countries.

Bacchantes (*bak-an'tez*), or **Bacchæ** (*bak'ē*).—Priestesses of Bacchus.

Bacchus (*bak'us*); called Dionysus (*dī-on-ī'sus*) by the Greeks. The god of wine; was the son of Jupiter and Semele, the daughter of Cadmus. Bacchus went on a traveling expedition through Syria and Asia, returning to Europe through Thrace, during which he taught men the cultivation of the vine and the elements of civilization. He married Ariadne (*q.v.*). Feasts in honor of Bacchus were called Bacchanalia, and were of a very noisy and riotous character. The vine, ivy and laurel were sacred to him, as were also the tiger, lynx, panther, ass, serpent and dolphin. Rams were usually sacrificed to his honor.

Banshee.—The domestic spirit of certain Irish or Scottish families, supposed to wail shortly before the death of one of the family. The banshee is allowed only to families of pure stock.

Baldur (*bâl'dör*,) or **Balder** (*bâl'der*).—In old Norse mythology, a son of Odin, and one of the principal gods. Baldur's characteristics are those of a sun-god. He is the "whitest" of the gods, and so beautiful and bright that a light emanates from him. He is

the wisest, most eloquent and mildest of the Ases. His dwelling is Breidablik. His wife is Nanna. He is finally slain, at the instigation of Loki, by a twig of mistletoe in the hands of the blind god Hodur. Baldur is specifically a Northern god; among the other Germanic races there is no existing record of him whatsoever.

Bellerophon (*bel-ler'o-fon*).—Son of Glaucus and grandson of Sisyphus. He incurred the hatred of Antea, wife of Proetus, king of Argos, who sent him to his father-in-law (Iobates) with a letter requesting the latter to put the young man to death. Iobates selected what seemed to be a sure method of compassing his death, by asking him to go and kill the Chimæra (*kī-mē'ra*) (*q.v.*). Bellerophon, however, obtained possession of the winged horse Pegasus (*q.v.*), which enabled him to rise in the air. He then slew the monster with his arrows. Iobates then sent him against the Solymi, a warlike race in Lycia, and afterwards against the Amazons; but in these expeditions also he was successful. Finally, he attempted to fly to heaven on Pegasus; but Jupiter sent a gad-fly to sting the horse, which threw its rider on to the earth.

Bellona (*bel-lō'na*).—The Roman goddess of war, sister of Mars.

Belphegor.—A god of evil, worshiped by the Moabites. An archfiend who had been an archangel.

Belus.—The name of the Chaldean sun-god.

Berg Folk.—Pagan spirits doomed to live on the Scandinavian hills till the day of redemption.

Bertha.—The white lady who guards good German children, but is the terror of the bad, who fear her iron nose and big feet. Corresponds to the Italian La Befana.

Bheem.—One of the five brotherhoods of Indian demigods, famous for strength.

Bifrost.—In Norse mythology, a bridge between earth and heaven, over which none but the gods could travel. It leads to the palace of the Fates.

Bilskirnir.—A wonderful palace built by Thor for the use of peasants after death.

Bona Dea (*bon'a de'a*), or **Fauna,** or **Fatua.**—A Roman goddess, sister, wife or daughter of Faunus. She was the goddess of chastity and prophecy, and revealed her oracles to females only. During her annual festival on the first of May, in the house of the consul or prætor, no male person was allowed to be present.

Boreas (*bor'e-as*).—The north wind; was the son of Astræus and Aurora, and brother of the other three winds, Notus, Zephyrus and Hesperus. He was worshiped at Athens, where a festival was celebrated in his honor.

Bosphorus, or **Bosporus.**—The Straits of Constantinople, so called from Io, who, in the form of a heifer, swam across it (Bosphorus=Ox-ford). See "Io."

Brahma.—The supreme god of the Hindus, represented with four heads and four arms. He is regarded as the creator of the universe, and forms, with Vishnu the preserver, and Siva the destroyer, the divine triad.

Briareus (*brī-ār'e-us*).—A hundred-armed giant, also called Ægæon (*q.v.*). Pope thus expresses his admiration for Handel:—

"Strong in new arms the giant Handel stands,
Like bold Briareus with a hundred hands."

Briseis (*brī-sē'is*).—Daughter of Brises and beloved by Achilles. She was the occasion of a feud between Achilles and Agamemnon.

Bucephalus (*bū-sef'a-lus*)—*i. e.* bull-headed. The favorite charger of Alexander the Great, so named because he was branded with a bull's head. No one but Alexander was able to mount this celebrated horse, which always knelt down to receive his master. He died in India after carrying Alexander through all his campaigns. Alexander built a city near the place where he died, and named it Bucephala in memory of him.

Busiris (*bū-sī'ris*).—A king of Egypt who cruelly sacrificed strangers to Jupiter. He attempted to sacrifice Hercules, but the latter slew him and all his ministers.

Buto (*bū'tō*).—An Egyptian goddess identified with Latona.

C

Cacus (*kā'kus*).—Son of Vulcan; a huge giant and notorious robber; lived in a cave on Mount Aventine. He stole the oxen of Hercules, which the latter had taken from Geryon, in Spain, whereupon Hercules slew him.

Cadmus (*kad'mus*).—Son of the Phœnician king Agenor, and brother of Europa. His father sent him to search for his sister, who had been carried off by Jupiter, and he was directed to follow a certain cow, and to build a city on the spot where the cow fell down with fatigue. In this way he became the founder of Thebes, in Bœotia. Near this place was a well guarded by a dragon, which Cadmus slew, and sowed the teeth of the monster. From these arose armed men, who killed each other, with the exception of five, who were the ancestors of the Thebans. All this he did on the direction of Minerva, and Jupiter gave him Harmonia for his wife. The marriage was celebrated in the citadel of Thebes, and all the Olympian gods were present at the ceremony. Cadmus gave Harmonia a famous robe of state (peplus) and a necklace (see "Harmonia") which he had received from Vulcan. Their children were Autonoë, Ino, Semele, Agave, Polydorus and Illyrius. Cadmus introduced among the Greeks an alphabet of sixteen letters.

Cæneus (*sē'nūs*).—Originally a maiden, named Cænis, who was beloved by Neptune and changed by him into a boy, and at the same time made invulnerable. In the lower worlds she recovered her female form.

Calchas (*kal'kas*).—The most eminent of the Greek soothsayers at the siege of Troy. He died of grief on meeting Mopsus, who was a wiser soothsayer, and predicted things which Calchas could not.

Calliope (*kal-lī'op-ē*).—The Muse of epic poetry. See "Musæ."

Callirrhoe (*kal-lir'ro-ē*).—Second wife of Alcmæon. She induced her husband to get the peplus and necklace of Harmonia, whereupon he was slain. See "Alcmæon."

Callisto (*kal-lis'tō*).—An Arcadian nymph beloved by Jupiter, by whom she became the mother of Arcas. Jupiter changed her into a she-bear, and afterwards placed her among the stars as *Ursa major.*

Calpe (*kal'pē*).—One of the Pillars of Hercules; now Gibraltar.

Calydon (*kal'i-dōn*).—A very ancient town in Ætolia. In the mountains around it the celebrated *Calydonian Boar Hunt* took place. The story is as follows: During the reign of Œneus, king of Calydon, Diana sent a huge boar to devastate the country, because the king had neglected her divinity. All the heroes of the age joined together for the purpose of killing this boar. Meleager, son of Œneus, slew the boar, and gave its hide to Atalanta, with whom he was in love. See "Atalanta."

Calypso (*kal-ip'sō*).—A nymph who ruled in the island of Ogygia, on which Ulysses was shipwrecked on his journey home from Troy. She desired Ulysses to marry her, and detained him on the island for seven years.

Camenæ (*kam-ē'nē*).—Originally prophetic nymphs belonging to the religion of ancient Italy, afterwards identified with the Muses.

Campus Martius (*kam'pus mar'shi-us*)—*i. e.* the plain of Mars; so named because it was consecrated to the god Mars. An open plain outside the walls of Rome, where the Roman youths performed their gymnastic and warlike exercises, and where the Roman people met for the purpose of electing magistrates.

Capitolium (*kap-it-ō'li-um*).—The temple of Jupiter and the citadel of Rome.

Cassandra (*kas-san'dra*).—Daughter of Priam, king of Troy, and Hecuba. She possessed great beauty, and was beloved by Apollo, who bestowed on her the gift of prophecy. She disappointed him, however, whereupon the god ordained that no one should believe her predictions. On the fall of Troy she fell to the share of Agamemnon, who took her to Mycenæ, where she was murdered by Clytæmnestra.

Castor and **Pollux** (*kas'tor, pol'luks*).—Twin brothers, often called the Dioscuri (*di-os'ku-rī*), *i. e.* sons of Zeus (Jupiter), because they were the sons of Jupiter and Leda, the wife of Tyndareus, king of Sparta. Castor was famous for his skill in managing horses, and Pollux for his ability as a boxer. Castor was supposed to be mortal, while Pollux was immortal. They took part in the celebrated expedition of the Argonauts, and assisted the Romans against the Latins in the great battle of Lake Regillus. They were greatly attached to each other, and were placed by Jupiter among the stars as Gemini (*jem'in-ī*), *i. e.* twins, where they served as a guide to mariners. They were worshiped more especially as the protectors of sailors.

Cauther.—In Mohammedan mythology the lake of paradise, whose waters are as sweet as honey, as cold as snow, and as clear as crystal; and any believer who tastes thereof is said to thirst no more.

Cecrops (*sē'krops*).—The most ancient king of Attica, founder of Athens. He decided in favor of Athena (Minerva) when she and Neptune contended for the possession of Attica. The citadel of Athens was called Cecropia after him.

Celeus (*sel'e-us*).—King of Eleusis, husband of Metanira, and father of Triptolemus and Demophon. He entertained the goddess Ceres, who in return taught his son Triptolemus (*q.v.*) agriculture.

Centauri (*sen-taw'rī*), or **Centaurs**—*i. e.* the bull-killers—were a fabulous race living in Thessaly, half men and half horses. They were defeated in a famous fight with the Lapithæ (*q.v.*), and expelled from their country. Chiron (*kī'ron*) was the most celebrated of them (*q.v.*).

Cephalus (*sef'al-us*).—Was beloved by Aurora, whose advances he rejected from love of his wife Procris. Aurora asked him to try the fidelity of Procris. Having metamorphosed him into a stranger, he appeared, laden with rich presents, before her. The presents caused her to yield, whereupon her husband discovered himself. She fled in shame to Crete, but afterwards returned, disguised as a youth, with a dog and spear (the gifts of Diana) that never missed their object. To obtain these, Cephalus promised to love the youth, who then made herself known to him as his wife Procris. In this way a reconciliation was effected. Afterwards Cephalus, while out hunting, accidentally killed her with the never-erring spear.

Cepheus (*sē'fūs*).—King of Ethiopia and father of Andromeda.

Cerberus (*ser'ber-us*).—The three-headed dog that guarded the entrance to the lower world.

Ceres (*sē'rēz*).—The goddess of agriculture, expecially of the cultivation of corn; called Demeter (*dē-mē-tēr*) by the Greeks. She was the daughter of Saturn and Rhea, and sister of Jupiter and Pluto. She became by Jupiter the mother of Proserpine. The latter was carried off by Pluto. When Ceres found this out, she did not allow the earth to bring forth any fruits, and Jupiter was compelled to send Mercury into the lower world to fetch back Proserpine. Pluto consented, but gave Proserpine part of a pomegranate to eat. In consequence of this she was obliged to spend one-third of the year with Pluto. The earth then brought forth fruit again. This legend evidently refers to the concealment of seed-corn in the earth and its subsequent reappearance above the surface. The Romans sacrificed pigs to Ceres. The decrees of the senate were deposited in her temple.

Ceyx (*sē'ix*).—Son of Lucifer and husband of Alcyone.

Charites (*char'it-ēz*)—Gr., the **Graces**—were the goddesses who confer all grace. They were the daughters of Jupiter and were three in number, their names being Aglaia (*ag-lā'i-a*), *i. e.* the bright one; Euphrosyne (*ū-fros'i-nē*), *i. e.* the cheerful or mirthful one; and Thalia (*thal-ī'a*), *i. e.* the blooming one. They were the personifications of grace and beauty, and enhanced by refinement and gentleness the enjoyments of life. They were the friends of the Muses and specially favored poetry.

Charon (*kār'on*).—Son of Erebus; was the ferryman of Hades who conveyed the souls of the departed across the rivers Acheron and Styx, receiving in return the obolus placed in the mouth of every corpse before burial.

Charybdis (*ka-rib'dis*).—A dangerous whirlpool between Italy and Sicily, opposite Scylla (*q.v.*).

Chibiabos.—A musician, ruler in the land of spirits, and friend of Hiawatha. Personification of harmony in nature.

Chimæra (*ki-mē'ra*)—*i. e.* a she-goat.—A fabulous, fire-breathing monster with a lion's head, a serpent's tail, and a *goat's* body. She was killed by Bellerophon, mounted on Pegasus. The myth relates to a volcano in Lycia.

Chione (*kī'on-ē*).—Daughter of Dædalion. She was shot by Diana because she compared her beauty with that of the goddess.

Chiron (*kī'ron*).—A centaur famous for his knowledge of medicine, plants, music and divination. Son of Saturn and Philyra, the tutor of Æsculapius, Achilles and Hercules. Being accidentally wounded by one of the poisoned arrows of Hercules, he gave up his immortality and was changed into the constellation Sagittarius.

Chloris (*klor'is*).—The Greek goddess of flowers, identical with Flora.

Chou.—An Egyptian god corresponding to the Roman Hercules.

Circe (*sir'sē*).—Daughter of Helios (the sun) and Perse, famous for her magic arts. She lived on the Island of Ææa, on which Ulysses was cast on his voyage home from Troy. Circe met his companions, whom he had sent to explore the country, and offered them a magic cup, on tasting which they all became, with the single exception of Eurylochus, changed into swine. Ulysses, on hearing of it, obtained from Mercury the root *moly*, which fortified him against enchantment, and compelled Circe to restore his companions to their former shape. He then remained with her for a year, and she bore him a son, Telegonus.

Clio (*klī'o*).—The Muse of history. See "Muse."

Clotho (*klō'thō*).—The spinner of the thread of life; one of the Fates. See "Parcæ."

Clusium (*klū'si-um*).—One of the oldest and most important of the twelve Etruscan cities, the residence of Porsena, in the neighborhood of which was the famous sepulchre of this king in the form of a labyrinth.

Clytæmnestra (*klī-tem-nes'tra*).—Daughter of Tyndarus and Leda, and sister of Helen, Castor and Pollux; wife of Agamemnon, and mother of Orestes, Electra and Iphigenia. While her husband was absent at Troy she lived with Ægisthus, and on his return the guilty pair murdered him. In revenge for this deed, her own son Orestes put her to death.

Cnidus (*knī'dus*), or **Gnidus.**—A city on the southwestern coast of Caria, in Asia Minor, highly celebrated for the statue of Venus, by Praxiteles, the famous sculptor, which stood in her temple there.

Cocytus (*ko-sī'tus*)—*i. e.* the river of wailing. A river in the lower world.

Colchis (*kol'chis*).—A country in Asia, lying on the eastern part of the Black Sea, celebrated on account of the Golden Fleece (see "Argonautæ").

Comus (*kō'mus*).—The god of mirth and joy, represented as a winged youth.

Concordia (*kon-kor'di-a*).—The Roman goddess of concord. Camillus, in B. C. 367, erected a temple in her honor to celebrate the reconciliation between the patricians and plebians.

Corybantes (*kor-i-ban'tes*).—Priests of Cybele (*sib'el-ē*), or Rhea, in Phrygia, who worshiped her with riotous dances to the sound of cymbals.

Creusa (*kre-ū'sa*).—Daughter of Priam and Hecuba, wife of Æneas, and mother of Ascanius. She perished at the capture of Troy.

Cronos (*kron'os*).—The Greek divinity corresponding to the Roman Saturnus (*q.v.*).

Cumæ (*kū'mē*).—A very ancient town on the coast of Campania, said to have been founded B. C. 1050. It was celebrated as the residence of the earliest Sibyl. Tarquinius Superbus died here.

Cupido (*kū-pī'dō*), or **Cupid** (*kū'pid*); called Eros (*er'ōz*) by the Greeks. The god of love, son of Venus, his father being either Jupiter, Mars or Mercury. He is represented as a boy with golden wings, armed with a bow and a golden quiver full of arrows. He is so mischievous that he shoots his arrows at gods and men alike. Sometimes his eyes are covered, so that he acts blindly. He is the usual companion of his mother.

Cybele (*sib'e-lē*); called Rhea (*rē'a*) by the Greeks. A goddess, originally Phrygian, regarded as goddess of the earth. She was daughter of Uranus (*ū'ran-us*) and Ge (*jē*), and the wife of Saturn, and the mother of Jupiter, Juno, Pluto, Neptune, Ceres and Vesta. As Saturn devoured all her children, Cybele, just before the birth of Jupiter, went to Crete. When Jupiter was born, she gave Saturn a stone wrapped up like an infant, which the god, supposing it to be the child, swallowed. Cybele is usually figured seated on a throne and having a crown of towers on her head. She is frequently referred to as the "tower-crowned Cybele." The lion was sacred to her.

Cyclopes (*si-klō'pēz*), or **Cyclops** (*sī'klops*)—*i. e.* beings with one *circular eye* in the middle of their foreheads. These were a fabulous race of giants living in Sicily. They were shepherds, but devoured human beings. They were also Vulcan's workmen, volcanoes, especially Mount Ætna in Sicily, being regarded as their workshops, in which they made the armor for gods and heroes. The chief among them was Polyphemus (*q.v.*).

Cyllene (*sil-lē'nē*).—The highest mountain in Peloponnesus, on which Mercury was born.

Cynthus (*sin'thus*).—A mountain of Delos, celebrated as the birthplace of Apollo and Diana, who are hence called, respectively, Cynthius and Cynthia (*sin'thi-a*).

Cyprus (*sī'prus*).—A large island in the Mediterranean, renowned in ancient, no less than in modern, times for its fertility. It was one of the chief seats of the worship of Venus.

Cythera (*si-thē'ra*).—An island in the Ægean Sea, celebrated for the worship of Venus.

D

Dædalus (*dē'da-lus*).—A mythical personage skillful as a sculptor and architect. He made the wooden cow for Pasiphaë, and when Pasiphaë gave birth to the monster, the Minotaur, Dædalus constructed the labyrinth in which it was kept. For doing this Minos, king of Crete, imprisoned him; but he escaped, and as Minos had seized all the ships on the coast of the island, Dædalus made wings for himself and his son Icarus, and they flew away. Dædalus flew safely

over the Ægean, alighting at Cumæ, in Italy; but Icarus was slower in his flight, and the rising sun melted the wax by which the wings were fastened to his body, and he fell into the sea and was drowned; hence that part of the sea was called *Icarian*.

Danae (*dan'a-ē*).—Daughter of Acrisius, king of Argos. Her father confined her in a brazen tower, as an oracle declared that she would have a son that would kill his grandfather. Here, however, Jupiter visited her in a golden shower, and she became the mother of Perseus. Acrisius then shut up mother and child in a chest, which he threw into the sea; but Jupiter caused the chest to come ashore at the island of Seriphos, when Dictys, a fisherman, found them and took them to the king of the country. See "Perseus."

Danai (*dan'a-ī*).—The Greeks. See "Danaus."

Danaides (*dan-ā'i-dēz*).—The fifty daughters of King Danaus (*q.v.*).

Danaus (*dan'a-us*).—Son of Belus and twin-brother of Ægyptus (see "Ægyptus"). Lynceus, son of Belus, whose life was spared by Hypermnestra, avenged the death of his brothers by killing his father-in-law, Danaus. The fifty daughters of Danaus—called the Danaides—were punished in the lower world by being compelled everlastingly to pour water into a sieve. From Danaus, who was king of Argos (which was the most ancient city of Greece), the Greeks collectively were called Danai.

Daphne (*daf'nē*).—Daughter of the river-god Peneus. Her great beauty attracted the god Apollo, who pursued her; but just as she was being overtaken her prayer for aid was answered by her being changed into a laurel tree, the Greek word for which is Daphne. This tree consequently became the favorite tree of Apollo and was sacred to him.

Dardanus (*dar'dan-us*).—Son of Jupiter and Electra, the mythical ancestor of the Trojans.

Deianira (*dē-ya-nī'ra*).—Daughter of Œneus and wife of Hercules. She was beloved by the river god Achelous and by Hercules; but Hercules overcame his opponent in a fight for her, and obtained her as his wife. She accidentally killed her husband by giving him a poisoned garment to wear, and on seeing what she had done hanged herself (see "Hercules").

Deidamia (*dē-id-a-mī'a*).—Daughter of Lycomedes, at whose court Achilles was concealed in maiden's attire. She became, by Achilles, the mother of Pyrrhus or Neoptolemus.

Deiphobus (*dē-if'ob-us*).—Son of Priam and Hecuba. After the death of Paris he married Helen. He was killed in a barbarous manner by Menelaus, Helen's first husband.

Delos (*dē'los*).—The smallest of the Cyclades (islands), the birthplace of Apollo and Diana, and the most holy seat of the worship of the former.

Delphi (*del'fī*).—A small town in Phocis, very celebrated on account of its oracle of Apollo. Homer always refers to it under its old name, Pytho. It was looked upon as the central point of the whole earth, and was hence called "the navel of the earth." The oracle was consulted in the center of the splendid temple of Apollo. Here there was a small opening in the ground, from which a mephitic vapor occasionally arose. A tripod was placed over this opening, and the priestess—called Pythia, from Pytho—sat on it. In this way she inhaled the vapor, and the words she then uttered were believed to be inspired by Apollo. The priests took the words down and communicated them to the persons who had desired to consult the oracle.

Demeter (*dē-mē-tēr*). See "Ceres."

Deucalion (*dū-kā'li-on*).—Son of Prometheus, king of Phthia, in Thessaly, and husband of Pyrrha. He and his wife were the only human survivors of a great deluge which Jupiter sent to destroy mankind. They were preserved during the nine days' flood in a ship which Deucalion built on the advice of his father. The ship finally rested on Mount Parnassus, in Phocis. On the direction of Themis, Deucalion and his wife threw "the bones of their mother," *i. e.* the stones of the earth, behind them, those thrown by Deucalion becoming men, and those thrown by Pyrrha becoming women. In this way the earth was repeopled.

Diana (*dī-ā'na*).—Twin-sister of Apollo, the virgin goddess of the moon and of hunting, called by the Greeks Artemis (*ar'te-mis*). She was the daughter of Jupiter and Latona, and was born on the island of Delos. She is represented as armed with a bow, quiver and arrows, and was also regarded as identical with the moon (in Greek, Selene), her brother Apollo being looked upon as the sun (or Helois).

Dido (*dī'dō*).—Daughter of the Tyrian king Belus, and reputed founder of Carthage. Æneas, on his journey from Troy, landed at Carthage, and was handsomely entertained by Dido. She fell in love with the hero, and, on his leaving her to proceed to Italy, she, in despair, destroyed herself on a funeral pile. Dido is also called Elissa.

Diomedes (*di-o-mē'dēz*).—A famous hero at the siege of Troy. He was the son of Tydeus and Deïpyle, and is hence frequently called Tydides (*ti-dī'dēz*). Next to Achilles, he was the bravest hero in the Greek army. The gods themselves were supposed to be taking part in this memorable siege, some being ranged on one side and some on the other. Diomedes was under the special protection of Minerva. He not only engaged in conflict with the Trojan heroes, Hector and Æneas, but even wounded both Venus and Mars, who had espoused the cause of the Trojans. Diomedes and Ulysses carried off the palladium from the city of Troy, the safety of which was contingent on its possession (see "Troy"). At the end of the Trojan war he returned to Argos, where he found his wife (Ægialea) living in adultery with Hippolytus—a punishment visited upon him by the angry Venus. He consequently left Argos, and went to Ætolia. He afterwards settled at Daunia, in Italy, where he married Evippe, the daughter of Daunus, and died at an advanced age.

Dione (*dī-ō'nē*).—A female Titan who became, by Jupiter, the mother of Venus.

Dirce (*dir'sē*).—Wife of Lycus, king of Thebes, who married her after divorcing his former wife, Antiope (*an'ti-o-pē*). On account of the cruelty with which she treated Antiope, Amphion and Zethus—Antiope's sons by Jupiter—took terrible vengeance on Dirce. They tied her to a wild bull, which dragged her about till she perished, and then threw her body into a fountain near Thebes, which was from that time called the Fountain of Dirce.

Dis (*dīs*).—A contraction of Dives, *i. e.* rich; the god of the infernal regions. See "Pluto."

Discordia (*dis-kor'di-a*); in Greek, Eris (*er'is*).—The goddess of strife or discord. She was the sister of Mars, and, with him, delighted in the noise and tumult of war. It was she who threw the celebrated golden apple into the assembly of gods, for a full account of the results of which see "Paris."

Donar.—A name given, sometimes, to Thor, the thunder-god, in Norse mythology.

Doris (*dōr'is*).—Daughter of Oceanus and Thetis. She married her brother Nereus (*q.v.*), and became the mother of the fifty Nereides.

Draupnir.—The marvelous ring belonging to Odin, with which he worked magic. It was burned on the funeral pyre of his son Balder.

Droma.—The chain forged for the purpose of binding the Fenris wolf, but which he broke. Hence the proverb, "to dash out of Droma."

Dryades (*dry'a-dez*), or **Dryads.**—Wood-nymphs. See "Nymphæ."

E

Echidna (*e-kīd'na*).—A monster, half woman and half serpent. She was the mother of the Chimæra, Cerberus, the Lernean Hydra, and other monsters. She was killed in her sleep by Argus with the hundred eyes.

Echo (*ek'ō*).—A nymph who, because she kept Juno in incessant conversation while Jupiter was sporting with the nymphs, was punished by being changed into an echo. In this state she fell in love with Narcissus—a beautiful youth, who was incapable of the tender passion—and, as her love was not returned, she pined away till nothing remained but her voice.

Elbegast.—One of the dwarfs of Scandinavian mythology who dwelt in a magnificent palace underground, and drew their servants from the bosom of the earth.

Elberich.—In the German hero-legends a dwarf who aided the Lombard emperor Otnit to win the daughter of the soldan of Syria. He is identical with the Oberon of French and English fairy mythology.

Egil.—The Vulcan of northern mythology, one of the three brothers who married the swan-maidens. He was a great archer, killed his brother, Volünd, by command of the king, and himself later became a peasant.

Electra (*e-lek'tra*).—Daughter of Agamemnon and Clytæmnestra. She saved the life of her brother Orestes, and afterwards the two avenged the death of Agamemnon by slaying their mother, Clytæmnestra. See "Orestes."

Eira—An attendant of the goddess Fuigga, and a skillful nurse. She gathered herbs and plants for the cure of both sickness and wounds and taught the science to women.

Eleusis (*el-ū'sis*).—A very ancient city of Attica, famous for its mysteries of Ceres, to whom was erected a magnificent temple.

Elis (*ē'lis*).—A country on the west coast of the Peloponnesus. In it was Olympia, where every four years a splendid festival was held in honor of Jupiter.

Elysium (*e-lizh'i-um*).—The Elysian fields. That part of the lower world which forms the abode of the blessed.

Enceladus (*en-sel'ad-us*).—One of the hundred-armed giants who made war upon the gods. He was slain by Jupiter, and buried under Mount Ætna.

Endymion (*en-dim'i-on*).—A youth of surpassing beauty who so moved the cold heart of the virgin goddess of the moon (Diana or Selene), that she kept him in a perpetual sleep on Mount Latmus, in Caria, that she might kiss him without his knowledge.

Eos (*ē'ōz*).—See "Aurora."

Ephesus (*ef'e-sus*).—The chief of the twelve Ionian cities in Asia Minor, with a celebrated temple of Diana. The latter was regarded as one of the wonders of the world. It was always a very flourishing city, and was visited by St. Paul and St. John.

Elf.—The water sprite, known also as Elb, from which the name of the river Elbe is said to be derived. Elves are more properly known as mountain fairies, or those airy creatures that dance on the grass or sit in the leaves of trees and delight in the full moon.

Elivagar.—In Norse mythology the name of a great stream in Chaos, flowing from a fountain in the land of mist. This stream was much frequented by the elves at their creation.

Erato (*er'a-tō*).—The Muse of amatory poetry. See "Muse."

Erebus (*er'e-bus*).—The god of darkness, son of Chaos and brother of Nox (night). The name signifies darkness, and is frequently used to designate the lower world.

Erechtheus (*e-rek'thūs*).—An ancient and mythical king of Athens. See "Athenæ."

Eridanus (*ē-rid'an-us*).—The Greek name of the river Padus (Po), into which Phaethon fell when struck by the lightning of Jupiter. See "Phaethon."

Erinyes (*er-in'i-es*).—The Furiæ (*q.v.*).

Erl-king.—Name given to the king of the elves, or a spirit of the air. According to tradition, its home is in the Black Forest of Germany, and it appears as a goblin, working harm and ruin, especially among children.

Eryx (*er'ix*).—A high mountain in the northwest of Sicily, on the summit of which stood an ancient and celebrated temple of Venus.

Eumenides (*ū-men'i-dēz*).—See "Furiæ."

Euphrosyne.—See "Charites."

Europa (*ū-rō'pa*).—The beautiful daughter of the Phœnician king Agenor. Jupiter was so charmed with her that he obtained possession of her by the following stratagem: He assumed the form of a bull among the herds of Agenor, and Europa and her maidens were delighted with the tameness of the noble animal, so much so that at length Europa ventured to mount his back, whereupon the god plunged into the sea and carried her over to Crete. Here Jupiter assumed his proper shape, and Europa bore him Minos, Rhadamanthus and Sarpedon.

Eurydice (*ū-rid'i-sē*).—Wife of Orpheus (*q.v.*).

Eurystheus (*ū-ris'thūs*).—Son of Sthenelus and grandson of Perseus, a king of Mycenæ. Jealous of the fame of Hercules, and wishing to destroy him, Eurystheus, at the command of Juno, imposed upon Hercules his famous twelve labors.

Euterpe (*ū-ter'pē*).—One of the Muses (*q.v.*).

F

Fada.—A fée or kobold of the south of France, sometimes called "Hada." These house-spirits, of which, strictly speaking, there are but three, bring good luck in their right hand and ill luck in their left.

Fafnir.—In northern mythology the eldest son of the dwarf king Hreidmar. The slaying of Fafnir is the destruction of the demon of cold or darkness who had stolen the golden light of the sun.

Fates.—See "Parcæ."

Faunus (*faw'nus*).—Son of Picus, grandson of Saturn, institutor of tillage and grazing, and after his death the protecting deity of agriculture and of shepherds, and also a giver of oracles. He is identical with the Greek god Pan, and is represented with horns and goat's feet.

Faustulus (*faws'tu-lus*).—A shepherd who brought up Romulus and Remus.

Flora (*flō'ra*).—The Roman goddess of flowers and spring.

Fortuna (*for-tū'na*); called Tyche (*tik'ē*) by the Greeks. The goddess of fortune. She is variously represented: with the horn of plenty, indicative of the plentiful gifts of fortune; with a rudder, to signify that she guides the affairs of men; with a ball, emblematic of the shifting and changing character of the fickle goddess.

Freki and **Geri.**—The two wolves of Odin. When Odin, seated on his throne, overlooks heaven and earth, his two wolves lie at his feet.

Frey.—Scandinavian god of the sun and of rain, and hence of fertility and peace. He was one of the most popular of the northern divinities. No weapons were ever allowed in Frey's temple, although oxen and horses were sacrificed to him. His name was connected with the taking of any solemn oath, a heavy gold ring being dipped in the blood of the sacrifice and the oath sworn upon the ring. One of the most celebrated of the temples built to Frey was at Therva, in Iceland.

Freyja.—She was the sister of Frey, and the wife of Odur, who abandoned her on her loss of youth and beauty, and was changed into a statue by Odin, as a punishment. She is known as the northern goddess of beauty and love; plants were called Freyja's hair, and the butterfly, Freyja's hen.

Frigga.—In Scandinavian mythology the wife of Odin, the queen of the gods, and the mother of Baldur, Thor, etc. She sometimes typifies the earth, as Odin does the heavens. The Anglo-Saxons worshiped her as Frea. The name survives in Friday.

Frodi.—The son of Frey, a god of peace. Under his direction two giantesses turned a pair of magic millstones which ground out gold according to his wish and filled his coffers. Excited by greed he forced them to labor, allowing rest only long enough for the singing of one verse. When Frodi himself slept, the giantesses changed their song and proceeded to grind out an army of troops to invade the land. These troops represent the vikings.

Furiæ (*fū'ri-ē*).—The Furies; called Eumenides (*ū-men'i-dēz*), *i. e.* the gracious or well-meaning ones, by the Greeks; three goddesses of vengeance, whom the Greeks so much dreaded that they dared not to call them by their real names, hence referred to them by the euphemism Eumenides. The Romans also called them Diræ (*dī'rē*). Their names were Alecto (*a-lek'tō*), Megæra (*me-gē'ra*) and Tisiphone (*tī-sif'-onē*). They were the daughters of Earth or of Night, and were terrible winged maidens with serpents twined in their hair and with blood dripping from their eyes. They were stern and inexorable, punishing the guilty both in this world and after death. They dwelt in Tartarus —*i. e.* Hades. The sacrifices offered to them were black sheep and a drink of honey mixed with water, the latter, called a *libation* (*lī-bā'shun*), being poured forth out of a cup in their honor.

G

Galatea (*gal-a-tē'a*).—A sea nymph. See "Acis."

Ganesa.—Goddess of wisdom, in Hindu mythology.

Gangler.—The gate-keeper in Odin's palace who gave the explanation of the northern mythology that it might be recorded.

Ganymedes (*gan-i-mē'dēz*), or **Ganymede** (*gan'i-mēd*).—Son of Tros and Callirrhoe, a beautiful youth who was carried off by Jupiter's eagle from Mount Ida to heaven, that he might be cup-bearer to the gods in place of Hebe. Jupiter compensated his father by presenting him with a pair of divine horses.

Garm.—A fierce dog that kept guard at the entrance of Hel's kingdom, the realm of the dead. He could be appeased by the offering of a Hel-cake which always appeared in the hand of one who, on earth, had given bread to the needy.

Genius (*jē'ni-us*).—The protecting spirit or genius of a person, place, etc.; called by the Greeks Dæmon. They were represented as the guardians of men and of justice, and the Greek philosophers held that every human being at his birth had a dæmon assigned to him, which accompanied him throughout life. Every place, also, had its genius, which appeared in the form of a serpent eating fruit placed before him. In works of art genii are commonly represented as winged beings.

Gerda.—Wife of Frey, and daughter of the frost giant Gymir. She is so beautiful that the brightness of her naked arms illuminates both air and sea.

Giallar Bridge.—The bridge of death, over which all must pass.

Giallar Horn, The.—Heimdall's horn, which went out into all worlds whenever he chose to blow it. According to northern mythology, he blew a long-expected blast as a rallying call to the battle which ended the reign of the gods Odin, Frey, and Tyr.

Gian ben Gian.—In Arabia, king of the Ginns or Genii, and founder of the Pyramids. He was overthrown by Azazel or Lucifer.

Gigantes (*ji-gan'tēz*).—A fabulous race of huge beings, with terrible countenances and the tails of dragons. They endeavored to storm the heavens, being armed with huge rocks and trunks of trees; but the gods, with the assistance of Hercules, destroyed them all, and buried them under Ætna and other volcanoes. This story probably had its origin in volcanic convulsions.

Glaucus (*glaw'kus*).—(i) A fisherman who became a sea-god by eating a part of the divine herb sown by Saturn. (ii) Son of Sisyphus. Was torn to pieces by his own mares, because he had despised the power of Venus. (iii) The commander of the Lycians in the Trojan war. He was slain by Ajax.

Golden Fleece.—See "Argonautæ."

Gill.—The infernal river of Scandinavian mythology.

Ginungagap.—In Norse mythology the vast chaotic gulf of perpetual twilight which existed before the present world, and separated the region of fog from the region of heat. Giants were the first beings who came to life among the icebergs that filled this vast abyss.

Gorgons (*gor'gonz*).—Three frightful female monsters who turned all they looked upon into stone. Their names were Medusa (*me-dū'sa*), Euryale (*ū-rī'al-e*) and Stheno (*sthē'no*), and they were daughters of Phorcys and Ceto. Their heads were covered with serpents in place of hair, and they had wings, frightful teeth and brazen claws. Of the three, Medusa alone was mortal. She was killed by Perseus (*q.v.*).

Gladsheim.—The palace of Odin, in which were the great hall Valhalla (the hall of the slain) and the twelve seats occupied by the gods when holding council.

Glasir.—A marvelous grove in Asgard, in which the leaves were all of shimmering red gold.

Glendoveer.—In Hindu mythology is a kind of sylph, the most lovely of the good spirits.

Gnome.—One of a class of spirits or imaginary beings which were supposed to tenant the interior parts of the earth, and in whose charge mines, quarries, etc., were left. Rübezahl, of the German legends, is often cited as a representative of the class.

Goblins and Bogies.—Familiar demons of popular superstition, a spirit which lurks about houses. It is also called hobgoblin. Goblin is used in a serious sense by Shakespeare in *Hamlet*, where the ghost is supposed to be a "spirit of health or goblin damned."

Graces, The Three.—See "Charites."

Gradivus (*grad-ī'vus*)—*i. e.* the marching one. A surname of Mars.

Grææ (*grē'ē*), lit., "the old women" (Gr.).—So called because they had gray hair from their birth. They were the sisters of the Gorgons, and were three in number. They had but one eye and one tooth to use between them.

Gyas (*jī'as*), **Gyes** (*jī'ēz*), or **Gyges** (*jī'jēz*).—One of the giants with a hundred hands who made war upon the gods.

H

Hades (*hā'dēz*).—See "Pluto."

Hæmon (*hē'mon*).—Son of Creon, king of Thebes. He loved Antigone, and killed himself on hearing that she was condemned by Creon to be shut up in a subterranean cave.

Harmonia (*har-mō'ni-a*).—Daughter of Mars and Venus, and wife of Cadmus. On the wedding-day Cadmus received a necklace, which afterwards became famous, inasmuch as it became fatal to all who possessed it.

Harpocrates (*har-pok'ra-tēz*).—The god of mystery and silence, and, on that account, represented as having been born with his finger in his mouth. He was the son of Osiris. His statue stood at the entrance of most of the Egyptian temples.

Harpyiæ (*har'pi-ē*).—The Harpies—*i. e.* the Robbers or Spoilers, hideous rapacious monsters, half bird and half woman. They were three in number. Homer described them as carrying off people who had disappeared.

Hebe (*hē-bē*).—The goddess of youth, daughter of Jupiter and Juno. She was the cup-bearer to the gods, in which office she was afterwards supplanted by Ganymede. She became the wife of Hercules after he was deified.

Hecate (*hek'a-tē*).—Daughter of Perses and Asteria, the presider over enchantments, etc. She was looked upon as a kind of threefold goddess—viz., Luna (the moon) in heaven, Diana on earth, and Proserpine in the lower world—and is accordingly represented with three bodies or three heads. Dogs, honey and black female lambs were sacrificed to her.

Hector (*hek'tor*).—Eldest son of Priam, king of Troy, and Hecuba, and husband of Andromache. He was the chief hero of the Trojans in their war with the Greeks. He was slain in single combat by Achilles, who chased him thrice round the walls of the city, and, after having slain him, tied his body to his chariot and dragged it thrice round the walls. The character of Hector as a warrior, husband, father and son is very finely drawn by Homer in the *Iliad*.

Hecuba (*hek'u-ba*).—Wife of Priam, king of Troy. After the fall of Troy she was carried away as a slave by the Greeks and suffered great misfortunes.

Heimdall.—In northern tales a god who lived in the celestial fort Himinsbjorg, under the farther extremity of the bridge Bifrost, and kept the keys of heaven. He is the watchman or sentinel of Asgard, sees even in sleep, can hear the grass grow, and even the wool on a lamb's back. Heimdall, at the end of the world, will wake the gods with his trumpet.

Helena (*hel'en-a*), or **Helene** (*hel'en-ē*); commonly called Helen of Troy. Daughter of Jupiter and Leda, and sister of Castor and Pollux. She was the greatest beauty of her age, and her hand was sought by the noblest chiefs of Greece. She chose Menelaus (*men-e-lā'us*), and became by him the mother of Hermione. She eloped with Paris (*q.v.*) to Troy, and hence arose the Trojan war, as all the Greek chiefs, who had been former suitors of Helen, resolved to avenge her abduction, and sailed with Menelaus against Troy. After the death of Paris she married his brother Deiphobus (*de-if'ob-us*). On the capture of Troy, after a ten years' siege, she became reconciled to Menelaus, and returned with him to Sparta, where they lived for a number of years in peace and happiness.

Helenus (*hel'e-nus*).—A celebrated soothsayer, son of Priam, king of Troy, and Hecuba. He deserted his countrymen and joined the Greeks—some say voluntarily, others that he was taken prisoner by the Greeks.

Heliades (*hē'li-a-dēz*).—Daughters of the Sun (Helios). They lamented the death of their brother Phaethon so bitterly that the gods, in compassion, metamorphosed them into poplar trees and their tears into amber.

Helicon (*hel'i-kon*).—A mountain in Bœotia, sacred to Apollo and the Muses. The famous fountains of the Muses, Aganippe and Hippocrene, sprang here.

Helios (*hē'li-os*).—The god of the sun. See "Phœbus" and "Apollo."

Helle (*hel'lē*).—Sister of Phrixus (*q.v.*). When she and her brother were riding through the air upon the ram with the golden fleece she fell into the sea, which was thence called the Hellespont—*i. e.* the sea of Helle; now called the Dardanelles.

Hephæstus (*hē-fēs'tus*).—The god of fire. See "Vulcan."

Hera.—See "Juno."

Hercules (*her'kū-lēz*); called Heracles (*hē'ra-klēz*) by the Greeks.—The most celebrated hero of antiquity, noted especially for his Twelve Labors. He was the son of Jupiter and Alcmene. He showed his prowess at a very early age, for when the jealous Juno sent two serpents to destroy him as he lay in his cradle, the infant hero strangled them with his own hands. His first great adventure happened while he was tending the oxen of his supposititious father, Amphitryon, the husband of Alcmene. A huge lion devastated the flocks of Amphitryon and Thespius, king of Thespiæ. Hercules slew the lion, and thenceforth wore the skin as a garment, although some state that the lion's skin of Hercules was taken from the Nemean lion which Hercules killed as one of his labors. Next he defeated and killed King Erginus, to whom the Thebans paid tribute. Creon, king of Thebes, gave him his daughter Megara in marriage, and she bore him several children. Soon afterwards Juno drove him mad, and in this state he killed his children. His grief was so great that he went into voluntary exile and was purified by Thespius. He then consulted the celebrated oracle at Delphi as to where he should settle, and was ordered to live at Tiryns and to serve Eurystheus (*ū-ris'thūs*) for twelve years, after which he should become immortal. It was at the bidding of Eurystheus that he performed the following Twelve Labors. Hercules usually carried a huge club which he had cut for himself in the neighborhood of Nemea.

(i) *The fight with the Nemean lion.* Eurystheus ordered Hercules to bring him the skin of this monster. Finding his club and arrows useless, he strangled the animal with his own hands.

(ii) *The fight against the Lernean Hydra.* This monster, which had nine heads, of which the middle one was immortal, dwelt in a swamp, and ravaged the country of Lerna, near Argos. When Hercules struck its heads with his club, for each head he struck off two more appeared. With the assistance of his servant he then burned off its heads, and buried the immortal one under a huge rock. Having done this, he poisoned his arrows with the bile of the monster, thus rendering the wounds inflicted by them incurable.

(iii) *Capture of the Arcadian stag.* This animal had golden antlers and brazen feet, and Hercules was ordered to bring it alive to Eurystheus. After pursuing it in vain for a whole year, he at length wounded it with an arrow, caught it, and bore it away on his shoulders.

(iv) *Capture of the Erymanthian boar.* Hercules chased this animal through the deep snow, and at last caught it in a net and delivered it alive to Eurystheus.

(v) *Cleansing of the stables of Augeas.* Augeas, king of Elis, had a herd of three thousand oxen, whose stalls had not been cleansed for thirty years, and Hercules was ordered to cleanse them in one day. He did it by turning the rivers Alpheus and Peneus through the stalls.

(vi) *Destruction of the Stymphalian birds.* These birds had brazen claws, wings and beaks, used their feathers as arrows, and ate human flesh. They dwelt on a lake near Stymphalus, in Arcadia. Minerva provided Hercules with a brazen rattle, by the noise of which he roused the birds and then killed them with his arrows.

(vii) *Capture of the Cretan bull.* This was a mad bull that made great havoc in the island of Crete. Hercules caught it, and brought it home on his shoulders.

(viii) *Capture of the mares of Diomedes.* These mares were fed with human flesh. Hercules, with a few friends, seized them and led them to Eurystheus.

(ix) *Seizure of the girdle of the queen of the Amazons.* The daughter of Eurystheus having expressed a desire to obtain the girdle of Hippolyte, queen of the Amazons, Hercules was sent to fetch it. After an eventful journey he at length reached the country of the Amazons, and was kindly received by Hippolyte. Juno, however, excited the Amazons against him, and in the contest that ensued Hercules killed Hippolyte and carried off her girdle.

(x) *Capture of the oxen of Geryon.* Geryon was a monster with three bodies. His cattle were guarded by a giant and a two-headed dog. On his journey he erected two pillars (Calpe and Abyla) on the two sides of the Straits of Gibraltar, which were hence called the Pillars of Hercules. He slew the giant, the dog and Geryon himself, and reached home safely with the oxen.

(xi) *Bringing the golden apples of the Hesperides* (*hes-per'id-ēz*). These apples, which were given by Ge (the earth) to Juno at her wedding, were kept by the Hesperides and a dragon on Mount Atlas. Hercules obtained the apples, and afterwards dedicated them to Minerva, who restored them to their former place.

(xii) *Bringing Cerberus from the lower world.* This was not only the last, but the most difficult of the Twelve Labors of Hercules. Pluto, the god of the lower world, having given Hercules permission to carry off Cerberus provided he did not use force of arms, he succeeded in seizing the monster and carrying it to the upper world, taking it back again after having shown it to Eurystheus.

Having concluded his Twelve Labors, Hercules was released from the servitude of Eurystheus and returned to Thebes. Later, he became a servant to Omphale (*om'fal-ē*), queen of Lydia and widow of Tmolus, and lived with her in an effeminate manner, he wearing woman's attire, while Omphale put on his lion's skin. He afterwards married Deianira (*q.v.*), who accompanied him into exile after he had accidentally killed the boy Eunomus. Having to cross a river, Hercules went on first, leaving his wife to be carried over by the centaur Nessus. The latter attempted to do violence to her, but her screams were heard by Hercules, who shot an arrow into the heart of Nessus. Deianira preserved some of the blood of the centaur, as he told her it would enable her to keep the love of her husband. Unfortunately, however, the blood was poisoned with the arrow with which Hercules had shot Nessus, so that when Hercules put on a garment which had been steeped in the blood he speedily suffered most terrible torture, and in endeavoring to wrench the garment off, tore whole pieces of flesh from his body. Deianira, on seeing what she had unwittingly done, hanged herself. Hercules was carried off by the gods to Olympus and married Hebe.

Hermes (*her'mēz*).—See "Mercury."

Hermione (*her'mi-o-nē*).—The beautiful daughter of Menelaus and Helen. She was married, first to Neoptolemus and secondly to Orestes.

Hero (*hē'rō*).—A priestess of Venus in Sestos, beloved by Leander (*q.v.*).

Hesione (*hē'si-o-nē*).—Daughter of Laomedon, king of Troy, who was exposed by her father to the fury of a sea-monster in order to appease the anger of Apollo and Neptune. Hercules rescued her and gave her to Telamon, to whom she bore Teucer.

Hesperides (*hes-per'id-ēz*).—The guardians of the golden apples given by Ge (the Earth) to Juno at her marriage with Jupiter. They were three in number, and were the daughters of Atlas and Hesperis. See "Hercules."

Hestia.—See "Vesta."

Hippocrene (*hip-po-krē'nē*)—*i. e.* the Fountain of the Horse. A fountain near Mount Helicon, sacred to the Muses, and which is fabled to have been produced by a stroke of the hoof of the winged horse Pegasus.

Hippodamia (*hip-po-da-mī'a*).—Wife of Pirithous, at whose nuptials took place the celebrated fight between the Centaurs and Lapithæ.

Hippolyte (*hip-pol'it-ē*).—Daughter of Mars and queen of the Amazons. She was slain by Hercules (*q.v.*).

Hippolytus (*hip-pol'it-us*).—Son of Theseus and Hippolyte. In consequence of a false accusation brought against him by his stepmother Phædra, he was thrown out of his chariot and dragged along the ground till he was dead. He was restored to life by Æsculapius.

Hippomenes (*hip-pō'men-ēz*).—Son of Megarus, who conquered Atalanta (*q.v.*) in a race.

Hobomoko.—An evil spirit known among American Indians.

Hödeken.—A famous German kobold, or domestic fairy servant; so called from wearing a little felt hat pulled down over his face.

Hoder.—In Norse mythology a blind god who destroyed his brother Baldur, at the instigation of Loki, without meaning to do so. He is the type of night and darkness, as Baldur is of light and day.

Hofvarpnir.—The fleet steed of Ina, in Scandinavian legend, which traveled through fire and air and enabled this messenger of the gods to see all that was happening on the earth.

Honir.—In Asgard tales, name given to the god of mind or thought.

Horæ (*ho'rē*); the Hours.—Daughters of Jupiter and Themis. They presided over the changes of the seasons, and kept watch at the gates of Olympus.

Horn of Plenty.—See "Amalthea."

Horus.—The Egyptian god of the sun, son of Osiris and Isis, who was also worshiped in Greece and at Rome.

Hugin.—One of Odin's two ravens, which carried him news from earth, and when not thus employed, perched upon his shoulders. The personification of thought or intellect.

Hugon.—A kind of evil spirit in the popular superstition of France—a sort of ogre made use of to frighten children.

Hyacinthus (*hi-a-sin'thus*).—A beautiful Spartan youth, beloved by Apollo, but accidentally killed by a blow of his quoit. From his blood sprang the flower of the same name.

Hyades (*hi'a-dēz*)—*i. e.* the Rainers. The name of seven nymphs forming a group in the head of Taurus. They were so called because when they rise simultaneously with the sun rainy weather is announced.

Hygeia (*hī-jē'i-a*).—The goddess of health, daughter of Æsculapius. She is often represented as a maiden in a long robe, and feeding a serpent from a cup.

Hylas (*hi'las*).—A beautiful youth who accompanied Hercules in the Argonautic expedition. On landing for water on the coast of Mysia, he was carried off by the Naiads.

Hymen (*hī'men*).—The god of marriage; represented as a handsome youth carrying in his hand a bridal torch.

Hymettus (*hi-met'tus*).—A mountain near Athens, famed for its honey and its marble.

Hyperborei (*hī-per-bor'e-i*)—*lit.* "beyond the north wind." A fabulous people living in the extreme north in a land of perpetual sunshine, in a state of perfect happiness.

Hyperion (*hī-per-ī'ōn*)—*lit.* "he who goes above." (i) A name applied to the sun. (ii) A Titan, father of the sun.

Hypsipyle (*hip-sip'i-lē*).—Daughter of Thoas, king of Lemnos, in the time of the Argonauts.

I

Iacchus (*i-ak'us*).—A name of Bacchus.

Iapetus (*i-ap'et-us*), or **Japetus.**—One of the Titans; father of Atlas, Prometheus and Epimetheus.

Icarus (*ī-kar'us*).—See "Dædalus."

Ichthyophagi (*ik-thi-of'a-jī*)—*i. e.* fish-eaters.—A name given by the ancients to various peoples on the coasts of Asia and Africa.

Ida (*ī'da*).—(i) A mountain range near Troy, celebrated as the scene of the judgment of Paris (*q.v.*). From the summit of Ida the gods watched the battles in the plain of Troy. (ii) A high mountain in Crete, on which Jupiter was brought up.

Idomeneus (*ī-dom'en-ūs*).—King of Crete, and leader of the Cretans against Troy. He rashly vowed to Neptune that, if the god granted him a safe return, he would sacrifice to him whatever he should first meet on landing. He was met by his son, whom he accordingly sacrificed. A plague came in consequence, and the Cretans expelled Idomeneus.

Iduna, or **Idun.**—Daughter of the dwarf Svald, and wife of Bragi. She kept in a box the golden apples which the gods tasted as often as they wished to renew their youth. Loki on one occasion stole the box, but the gods compelled him to restore it. Iduna seems to personify that part of the year when the sun is north of the equator. Her apples indicate fruits generally. Loki carries her off to Giant-land when the sun descends below the equator, and he steals her apples. In time, Iduna makes her escape, in the form of a sparrow, when the sun again rises above the equator; and both gods and men rejoice in her return.

Iling.—In Scandinavian mythology the great stream between the earth and the sacred lands, whose waters never froze.

Ilioneus (*ī'li-o-nūs*).—The youngest son of Niobe.

Ilium (*ī'li-um*).—A poetical name for Troy, derived from Ilus, the son of Tros, its founder. See "Troja."

Indra.—In Hindu mythology the ever-youthful god of the firmament, and the omnipotent ruler of the elements. He is a most important personage in Indian fable. In the Vedic period of the Hindu religion, he occupied a foremost rank, and, though degraded to an inferior position in the Epic, he long enjoyed a great legendary popularity. In works of art he is represented as riding on an elephant.

Ino (*ī'nō*).—Daughter of Cadmus and Hermione, wife of Athamas, king of Thebes.

Io (*ī'ō*).—Daughter of a king of Argos; beloved by Jupiter, and through fear of Juno changed into a cow (see "Argus"). Juno now tormented her with a gadfly, and drove her from land to land, swimming the Bosphorus (*i. e.* ox-ford), until she found rest at length in Egypt, where she regained her original form. She was afterwards worshiped as an Egyptian divinity under the name of Isis.

Iolaus (*ī-o-lā'us*).—The faithful companion and charioteer of Hercules.

Iphigenia (*if-i-jen-ī'a*).—Daughter of Agamemnon and Clytæmnestra, who was to have been offered up by way of expiation for an offense committed by her father against Diana in killing a hart in her sacred grove; but the goddess put a hart in her place and conveyed her to Tauris, when she became the priestess of the goddess. Here she afterwards saved her brother Orestes (*q.v.*).

Iris (*ī'ris*).—The swift-footed messenger of the gods, the personification of the rainbow. She was the sister of the Harpies.

Isis (*ī'sis*).—One of the chief Egyptian goddesses. See "Io."

Isocrates (*ī-sok'ra-tēz*).—A celebrated orator and teacher of rhetoric at Athens. He acquired a large fortune by his profession. He put an end to his life B. C. 338, aged ninety-eight.

Israfil.—Known among Arabians as the angel of music, who possessed the most melodious voice of all God's creatures. This is the angel who is to sound the resurrection trump, and make music for the saints in paradise. Israfil, Gabriel and Michael were the three angels that warned Abraham of Sodom's destruction.

Ithaca (*ith'ak-a*).—An island in the Ionian Sea, celebrated as the birthplace and the kingdom of Ulysses.

Iulus (*ī-ūl'us*).—Son of Ascanius and grandson of Æneas.

Ixion (*iks-ī'on*).—King of the Lapithæ, in Thessaly, and father of Pirithous. Jupiter purified him of a treacherous murder, yet he was sufficiently ungrateful to attempt to win the love of Juno. Jupiter then hurled him into Tartarus, where he was bound fast to a perpetually revolving wheel.

J

Jamshid.—King of the genii, famous for a golden cup full of the elixir of life. This cup, hidden by the genii, was discovered while digging the foundations of Persepolis.

Janus (*jā'nus*).—An old Latin deity, the sun-god. He presided over the beginning of everything; he opened the year, and hence the first month of the year was called after him. He was the porter of heaven. His temple in the Forum had two doors opposite each other, which in time of war were open and in time of peace were shut. The latter happened only thrice in Roman history. He is represented with a face at the back, as well as one at the front, of his head.

Japetus.—See "Iapetus."

Jason (*jā'son*).—The famous leader of the Argonauts; was the son of Æson, king of Thessaly, who reigned at Iolcus. The principal part of his history is given under "Argonautæ." During his absence, while on the Argonautic expedition, his uncle Pelias had slain his father. In order to avenge this deed Medea, the wife of Jason, persuaded the daughters of Pelias to cut their father to pieces and boil him, in the belief that he would thus be restored to youth and vigor. Medea, who was well versed in magic arts, had previously changed a ram into a lamb by similar treatment. In this way, then, Pelias perished miserably, and his son Acastus expelled Jason and Medea from Iolcus. They then went to Corinth, where they lived happily for several years, until Jason deserted her in favor of Creusa, the daughter of Creon, king of Corinth. Medea took fearful vengeance. She sent Creusa a poisoned garment, which burned her to death when she put it on; the palace also took fire, and her father, Creon, perished in the flames. Medea then killed her children, and fled to Athens in a chariot drawn by winged dragons.

Jinn.—A sort of fairies in Arabian mythology, the offspring of fire. They are governed by a race of kings named Suleyman, one of whom "built the pyramids." Their chief abode is the mountain Kâf, and they appear to men under the forms of serpents, dogs, cats, monsters, or even human beings, and become invisible at pleasure. The evil jinn are ugly, but the good are beautiful. According to fable, they were created from fire two thousand years before Adam was made of earth.

Jord.—Daughter of Night and mother of Thor. In Scandinavian mythology the name given to primitive earth.

Juggernaut, or **Jaggernaut.**—A Hindu god. The temple of this god is in a town of the same name in Orissa.

Juno (*jū'no*); called Hera (*hē'ra*) by the Greeks.—The sister and wife of Jupiter, and queen of heaven; daughter of Saturn and Rhea. She was the guardian deity of women, and presided over marriage. She specially watched over the birth of children, and was then invoked under the name of Lucina (*lū-sī'na*). Homer described her as being of a jealous, obstinate and quarrelsome disposition. In consequence of the judgment of Paris (*q.v.*), she was hostile to the Trojans, and accordingly sided with the Greeks in the Trojan war. The peacock was sacred to Juno. Juno was also regarded as the guardian of the finances, and had a temple on the Capitoline hill, which contained the mint. Mars, Vulcan and Hebe were her children.

Jupiter (*jū'pit-er*); called Zeus (*zūs*) by the Greeks.—King of heaven, and greatest of the Olympian gods; was a son of Saturn and Rhea. He dwelt on Mount Olympus, in Thessaly. He was the father and supreme ruler of gods and men. His first wife was Metis (*q.v.*). By Juno, his second wife, he had two sons, Mars and Vulcan, and one daughter, Hebe. The eagle, the oak, and doves were sacred to Jupiter. He was armed with thunderbolts, and surrounded with thick clouds, the former being provided for him by the Cyclops who worked under the direction of Vulcan. Jupiter was regarded as the special protector of Rome, and had a temple on the Capitol. He was looked upon as the guardian of law and the protector of justice and virtue. He was also the ruler of the lower air, hence rain and storms were supposed to come from him. In this connection the Romans applied the surname *Pluvius* (*i. e.* the rain-bringer) to him, and special sacrifices were offered to him during long-protracted droughts.

Juventas (*jū-ven'tas*).—The Roman name for Hebe (*q.v.*), the goddess of youth.

K

Kama.—The Hindu god of love. His wife is Rati (voluptuousness), and he is represented as riding on a sparrow, holding in his hand a bow of flowers and five arrows, each tipped with the bloom of a flower supposed to conquer one of the senses. His power is so much exalted that even the god Brahma is said to succumb to it.

Kami.—The gods of ancient Japan. The name, in modern times, designates any spiritual saint, and may also be applied to a prince.

Kaswa.—The camel admitted into Moslem paradise, the favorite camel of Mohammed which fell on its knees in adoration when "the prophet" delivered the last clause of the Koran to the assembled multitude at Mecca.

Kederli.—In Mohammedan mythology is a god corresponding to the English St. George, and is still invoked by the Turks when they go to war.

Kelpie.—In mythology of Scotland a spirit of the water seen in the form of a horse. Each lake has its kelpie.

Kobold.—A house-spirit in German superstition. In northern lands the name is sometimes used in place of elf or dwarf, representing an underground spirit. Probably the same as the Scotch brownie.

Koppelberg.—The hill which miraculously opened to receive the children who followed the Pied Piper. This belongs to mythology, as people in the middle ages considered Odin as the leader of disembodied spirits, and from this came the Pied Piper. The rats were the restless souls of the dead, which the Pied Piper released by drowning.

Krishna.—In Hindu mythology the eighth incarnation of Vishnu. According to some authorities, he is considered distinct from all the Avatars, as these had only a portion of the divinity, and Krishna was Vishnu himself in the form of "the Black One."

L

Ladon (*lā'don*).—The dragon that guarded the apples of the Hesperides. It was slain by Hercules.

Laertes (*lā-er'tēz*).—King of the island of Ithaca and father of Ulysses. He took part in the Calydonian boar hunt, and in the Argonautic expedition. He lived to see the return of his son to Ithaca, after the fall of Troy.

Laius (*lā'i-us*).—King of Thebes and father of Œdipus.

Laocoon (*lā-ok'o-on*).—A Trojan, priest of Apollo, who strenuously opposed the admission of the wooden horse into Troy (*q.v.*). As he was preparing to sacrifice a bull to Neptune, two fearful serpents swam out of the sea and strangled both him and his two sons.

Laodamia (*lā-od-a-mī'a*).—Daughter of Acastus and wife of Protesilaus.

Laodice (*la-od'i-sē*).—(i) Daughter of Priam and Hecuba. (ii) The name given by Homer to Electra, daughter of Agamemnon and Clytæmnestra.

Laomedon (*lā-om'e-don*).—King of Troy, father of Priam.

Lapithæ (*lap'i-thē*).—A mythical people inhabiting the mountains of Thessaly. They were ruled by Pirithous, who, as Ixion's son, was half-brother of the Centaurs. When Pirithous married Hippodamia, and invited the Centaurs to the marriage feast, the latter, fired by wine, attempted to carry off the bride and the other women. Hence arose the celebrated fight between the Centaurs and the Lapithæ, in which the former were defeated. The Lapithæ are said to have invented bits and bridles for horses.

Lares (*lār'ēz*).—Household divinities—the divinities presiding over the hearth, and the whole house. In great houses the images of the Lares were placed in a separate compartment. At meal times some portion was offered to the Lares, and on festive occasions they were adorned with wreaths.

Latinus (*la-tī'nus*).—King of Latium, who gave Æneas his daughter Lavinia in marriage.

Latmus (*lat'mus*).—A mountain in Caria, on which Endymion (*q.v.*) lay in perpetual sleep.

Latona (*la-tō'na*); called Leto (*lē'tō*) by the Greeks. The mother of Apollo and Diana, by Jupiter. She was persecuted by Juno, and wandered from place to place till she came to Delos, which was then a floating island, but which Jupiter fastened by adamantine chains to the bottom of the sea. Here Apollo and Diana were born.

Lavinia (*la-vin'i-a*).—Daughter of Latinus and wife of Æneas.

Leander (*lē-an'der*).—A young man of Abydos (*a-bī'dos*), who swam across the Hellespont every night to visit Hero, the priestess of Venus, in Sestus. One night, however, during a storm, he perished; and when his corpse was washed on the coast, on the following morning, Hero threw herself into the sea.

Leda (*lē'da*).—Wife of Tyndarus, king of Sparta. Jupiter visited her in the form of a swan, and she became the mother of Castor and Pollux, the celebrated Helen of Troy, and Clytæmnestra.

Lemnos (*lem'nos*).—One of the largest islands in the Ægean Sea; the abode of Vulcan, who was said to have fallen here when he was hurled down from Olympus. It is now called Stalimene.

Lemures.—The specters or spirits of the dead. They were said to wander about at night, as specters, and to torment and frighten the living. In order to propitiate them the Romans celebrated the festival of the *Lemuralia* or *Lemuria*.

Lerna (*ler'na*).—A forest and marsh near Argos, through which flowed a stream of the same name. Here Hercules killed the famous Lernean hydra. See "Hercules."

Lesbos (*les'bos*).—A celebrated island in the Ægean Sea, off the coast of Mysia. Its principal city was Mytilene. It was the birthplace of Sappho, Arion, Alcæus and Theophrastus.

Lethe (*lē'thē*)—*lit.* "forgetfulness" (Gr.).—A river in the lower world, the water of which was drunk by the shades, who thus obtained forgetfulness of the past.

Leto.—See "Latona."

Liber (*lī'ber*).—An old Italian deity who presided over planting and fructification. Subsequently the name was applied to Bacchus.

Libera (*lī'ber-a*).—Another name for Proserpine, daughter of Ceres, and sister of Liber.

Libitina (*lib-i-tī'na*).—The goddess of the dead, in whose temple at Rome everything pertaining to burials was sold or hired out.

Lidskialf.—The throne of Alfadir, whence he can view the whole universe.

Lif.—In Norse mythology the name given to a man who is to occupy the purified earth when goodness resumes its sway.

Lilinau.—In American Indian folk-lore Lilinau was wooed by a phantom. She followed his green waving plume through the forest, and was never seen again.

Lilith.—In Hebrew mythology a female specter who lies in wait for children in order to destroy them. The older traditions tell of Lilith as a former wife of Adam and the mother of demons. Amulets were worn as protection from her powers.

Lobaircin.—In Irish mythical tales a fairy shoemaker resembling an old man, who resorts to out-of-way places where he is discovered by the noise of his hammer. He is rich, and, while anyone keeps his eye fixed upon him, cannot escape, but the moment the eye is withdrawn he vanishes.

Lofu.—The Scandinavian god who guards friendship.

Lofua.—The Scandinavian goddess who reconciles lovers.

Loki.—The great god of fire in Norse mythology.

Lorelei.—In German legend a siren who haunted a rock of the same name on the right bank of the Rhine. She combed her hair with a golden comb, and sang a wild song which enticed fishermen and sailors to destruction on the rocks and rapids at the foot of the precipice. In northern mythology Lorelei is represented as immortal, a daughter of the Rhine, and dwelling in the river bed.

Lotis (*lō'tis*).—A nymph who, to escape from Priapus, son of Bacchus, was changed into the lotus tree.

Lotophagi (*lō-tof'a-jī*)—*i. e.* lotus-eaters.—A people visited by Ulysses during his voyage homewards from Troy. The lotus was a fruit the taste of which was so delicious that all who ate it lost all desire to return to their native land.

Lua (*lu'a*).—A goddess to whom were devoted the arms taken in battle.

Lucifer (Lat.), or **Phosphorus** (Gr.)—*i. e.* the light-bringer. The planet Venus when it appears as the morning-star.

Lucina (*lū-sī'na*).—The goddess that presides over the birth of children. It was used as a surname for Juno.

Lud.—In ancient British mythology the king of the Britons.

Luna (*lū'na*).—Goddess of the moon, called by the Greeks Selene (*sel-ē'nē*), and identified with Diana.

Lupercus (*lu-per'kus*).—A deity who protected the flocks from wolves.

Lycæus (*li-sē'us*).—A lofty mountain in Arcadia, where Jupiter and Pan were worshiped.

Lycaon (*li-kā'ŏn*).—King of Arcadia, who impiously placed a dish of human flesh before Jupiter when the god visited him. He and all his sons were metamorphosed into wolves.

Lyceum (*li-sē'um*).—A gymnasium at Athens, outside of the city; celebrated as the place where Aristotle and the Peripatetics taught. It derived its name from the temple of Apollo Lyceus (*li-sē'us*) in the neighborhood.

Lycomedes (*li-ko-mē'dēz*).—King of Scyros, to whose court Achilles was sent, disguised as a maiden, by his mother Thetis, in order to prevent him going to the Trojan war.

Lycurgus (*li-sur'gus*).—Son of Dryas, and king of the Edones in Thrace. He prohibited the worship of Bacchus, and was hence driven mad by the gods, and subsequently killed.

Lynceus (*lin'sūs*).—One of the Argonauts, famous for the keenness of his sight.

Lyncus (*lin'sus*).—A Scythian king, who was changed by Ceres into a lynx.

M

Machaon (*ma-kā'ŏn*).—Son of Æsculapius, a famous surgeon of the Greeks before Troy.

Maia (*mā'i-a*).—Daughter of Atlas and Pleione, and the eldest and most beautiful of the several Pleiades. She became, by Jupiter, the mother of Mercury.

Manes (*mā'nēz*)—*lit.* "the good, benevolent."—The name given by the Romans to the souls of the dead, who were worshiped as gods.

Mani.—Name given in ancient Norse mythology to the moon. Later known as the son of Mundilfori; taken to heaven by the gods to drive the moon-car. He is followed by a wolf, which, when time shall be no more, will devour both Mani and his sister Sol.

Manitou.—The great spirit of American Indians.

Marica (*ma-rī'ka*).—A Latin nymph, the mother of Latinus.

Mars (*märz*); called by the Greeks Ares (*ā'rēz*).—The god of war, of husbandry, of shepherds, and seers, who, as father of Romulus, was the progenitor of the Roman people. He was the son of Jupiter and Juno. He loved, and was beloved by Venus. The wolf and the woodpecker were sacred to Mars.

Marsyas (*mar'si-as*).—A satyr who, having found the flute which Minerva had thrown away because it distorted her features whilst playing it, rashly challenged Apollo to a musical contest. Apollo played upon the cithara and Marsyas upon the flute, and the Muses were the umpires. They decided in favor of Apollo, who then bound Marsyas to a tree and flayed him alive in accordance with the conditions of the contest —namely, that the victor should do what he pleased with the vanquished.

Medea (*mē-dē'a*).—Daughter of Æëtes, king of Colchis; celebrated for her skill in magic. She assisted Jason in obtaining the Golden Fleece (see "Argonautæ"), and accompanied him to Greece. She effectually stopped her father's pursuit by killing her brother Absyrtus (*q.v.*), and strewing his body cut in pieces on the sea-shore. See "Jason."

Medusa (*me-dū'sa*).—See "Gorgons."

Megæra (*me-gē'ra*).—See "Furiæ."

Megin-giord.—A magic belt worn by the god Thor. He once proposed to show his strength by lifting great weights, but when challenged to pick up the giant's cat, he tugged and strained, only to succeed in raising one paw from the floor, although he had taken the precaution to enhance his strength as much as possible by tightening his belt Megin-giord.

Meleager (*mel-e-ā'ger*).—Son of Œneus, king of Calydon; was one of the Argonauts, and also the leader of the heroes who took part in the celebrated Calydonian boar hunt. See "Calydon."

Melicerta (*mel-i-ser'ta*), or **Melicertes.**—Son of Ino and Athamas. When Athamas was seized with madness he pursued Ino and Melicertes, who in order to escape had to throw themselves into the sea, whereupon both were changed into marine deities. Ino becoming Leucothea, and Melicertes a sea-god, called by the Greeks Palaemon, and by the Romans Portunus.

Melos (*mē'los*).—An island in the Ægean Sea, and the most southwesterly of the Cyclades. It is now called Milo, and here was found the celebrated statue known as the "Venus of Milo." See "Venus."

Melpomene (*mel-pom'en-ē*).—The muse of tragedy. See "Musæ."

Memnon (*mem'nŏn*).—The handsome son of Tithonus and Aurora; was king of the Ethiopians. He went to the aid of Priam, king of Troy, towards the end of the Trojan war, but was slain by Achilles. His colossal marble statue at Thebes (which, however, in reality represented the Egyptian king Amenophis) when struck by the first rays of the rising sun was said to emit a sound resembling that of a plucked string.

Menelaus (*men-e-lā'us*).—Son of Atreus, the husband of the beautiful Helen and father of Hermione; king of Lacedæmon (or Sparta), younger brother of Agamemnon. Paris (*q.v.*), having been promised the most beautiful woman in the world for his wife, sailed to Greece under the protection of Venus, and was hostably received in the palace of Menelaus at Sparta. Here he succeeded in carrying off Helen, and thus arose the Trojan war, the object of which was to recover Helen. In the Trojan war Menelaus met Paris in single combat, and would have killed him had he not been carried off in a cloud by Venus. After the death of Paris, Helen married his brother Deiphobus, who was barbarously put to death by Menelaus at the taking of Troy. Helen secretly introduced Menelaus into the chamber of Deiphobus, and thus became reconciled to him. Menelaus and Helen then sailed away from Troy, and after eight years' wandering about the shores of the Mediterranean finally reached Sparta, where they passed the rest of their lives in peace and wealth.

Mentor (*men'tor*).—The faithful friend of Ulysses.

Mephistopheles.—One of the seven chief devils in the old demonology, the second of the fallen archangels, and the most powerful of the infernal legionaries after Satan. He figures in the old legend of *Dr. Faustus* as the familiar spirit of that magician. To modern readers he is chiefly known as the cold, scoffing, relentless fiend of Goethe's *Faust*, and the attendant demon in Marlowe's *Faustus*.

Mercurius (*mer-kū'ri-us*), or **Mercury** (*mer'kū-ri*), called Hermes (*her'mēz*) by the Greeks.—Son of Jupter and Maia; the messenger of the gods, and the god of commerce and gain. As the herald of the gods, he was the god of eloquence. He was the god of prudence and cunning, also of fraud and theft. Being the messenger of the gods, he was likewise looked upon as the god of roads who protected travelers; and was the god of music and of chemistry, hence the words *hermetic, hermetically* (sealed). He was employed by the gods to conduct departed souls to the lower world. He invented the lyre, which he first made by stretching strings across the shell of a tortoise. The palm tree, the tortoise, the number 4, and several kinds of fish were sacred to him. He is generally represented with a hat having two wings; a pair of winged sandals, which carried him with the speed of wind across land and sea; and, as messenger of the gods, he carries in his hand a wand or *caduceus* (*ka-dū'se-us*), having two serpents intertwined at one end of it.

Meriones (*mē'ri-o-nēz*).—The charioteer of Idomeneus, and one of the bravest heroes in the Trojan war.

Mermaids.—Wave maidens of northern mythology and classed with nymphs in Grecian and Roman. They were generally represented as young and beautiful virgins, partially covered with a veil or thin cloth, bearing in their hands vases of water, or shells, leaves, or grass, or having something as a symbol of their appropriate offices. They were attendants of the gods.

Meru.—In Hindu mythology a sacred mountain, eighty thousand leagues high, situated in the center of the world. It is the abode of Indra, and abounds with every charm that can be imagined. The Olympus of the Indians.

Merope (*mer'o-pē*).—Daughter of Atlas, one of the Pleiades.

Metis (*mē'tis*)—*lit.* wisdom, prudence (Gr.).—Daughter of Oceanus and Tethys, and the first wife of Jupiter. Fearing that she might give birth to a child who should become more powerful than himself, Jupiter swallowed her. Afterwards Minerva sprang from his head.

Midgard.—In Scandinavian mythology the name given to the earth. Out of the giant's flesh they fashioned Midgard (middle garden), as the earth was called, which was placed in the exact center of the vast space, and hedged all around with Ymir's eyebrows, which formed its bulwarks or ramparts. The solid portion of Midgard was surrounded by the giant's blood or sweat, which now formed the ocean, while his bones made the hills, his flat teeth the cliffs, and his curly hair the trees and all vegetation.

Midgard Sormen (earth's monster).—The great serpent that lay in the abyss at the root of the celestial ash. Child of Loki.

Milo.—The modern name for the island of Melos (*q.v.*).

Mimir.—In Scandinavian mythology the god of wisdom. Also god of the ocean, which is called "Mimir's well," in which wit and wisdom lay hidden, and of which he drank every morning from the horn Gjallar.

Minerva (*min-er'va*); called Athena (*a-thē'na*), Pallas Athene (*pal'las*), or simply Pallas, by the Greeks.—The goddess of wisdom, of the arts and sciences, of poetry and of spinning and weaving, and the protectress of agriculture. She was also a goddess of war. She was the daughter of Jupiter and Metis (*q.v.*). She was the protective deity of Athens, which was so named in honor of her (Athena): see "Athenæ." The owl, serpent, cock and olive tree were sacred to her.

Minos (*mī'nos*).—(i) Son of Jupiter and Europa, brother of Rhadamanthus, king and lawgiver in Crete, and after death one of the three judges of the shades in the infernal regions (the other two being Rhadamanthus and Æacus). (ii) Grandson of the former, likewise king of Crete, the husband of Pasiphaë and the father of Ariadne and other children. His son Androgeos (*q.v.*) having been shamefully treated by the Athenians, he made war against the latter and compelled them to send every year to Crete, as tribute, seven young men and seven maidens to be devoured by the Minotaur. This Minotaur was a terrible monster, with the head of a bull and the body of a man, the offspring of Pasiphaë and a bull. It was kept in a labyrinth constructed by Dædalus, but was slain by Theseus (*q.v.*), with the help of Ariadne, the daughter of Minos.

Minotaur (*mī'no-tawr*)—*i.e.* the bull of Minos (Lat.) —See "Minos."

Minyæ (*min'i-ē*).—The Minyans, an ancient Greek race dwelling in Thessaly. The Argonauts, being mainly Minyans, are called Minyæ.

Mithras (*mith'ras*).—The sun-god of the Persians.

Mjolnir.—From mythology of northern lands. The name of Thor's celebrated hammer—a type of the thunderbolt—which, however far it might be cast, was never lost, as it always returned to his hand; and which, whenever he wished, became so small that he could put it in his pocket.

Mnemosyne (*nē-mos'i-nē*)—*i. e.* memory (Gr.).—The mother of the Muses.

Moakkibat.—A class of angels, according to the Mohammedan mythology. Two angels of this class attend every child of Adam from the cradle to the grave. At sunset they fly up with the record of the deeds done since sunrise. Every good deed is entered ten times by the recording angel on the credit or right side of his ledger, but when an evil deed is reported the angel waits seven hours, "if happily in that time the evil-doer may repent."

Moloch.—A god of the Phœnicians to whom human victims, principally children, were sacrificed. Moloch is figurative of the influence which impels us to sacrifice that which we ought to cherish most dearly.

Momus (*mō'mus*).—The god of mockery and censure.

Mona (*mon'a*).—The isle of Anglesey; sometimes supposed to be the isle of Man. It was one of the chief seats of the Druids.

Moneta (*mon-ē'ta*).—A Roman surname of Juno as the protectress of money.

Mopsus (*mop'sus*).—The name of two soothsayers, one being the prophet of the Argonauts, and the other the son of Apollo and Manto. He contended in prophecy with Calchas (*q.v.*), whose superior he proved himself to be.

Morpheus (*mor'fe-us*).—The son of sleep and the god of dreams. The name signifies (Gr.) the fashioner, moulder, so called from the shapes he calls up before the sleeper.

Mowis.—The bridegroom of Snow, who (according to American Indian tradition) wooed and won a beautiful bride; but when morning dawned, Mowis left the wigwam, and melted into the sunshine. The bride hunted for him night and day in the forests, but never saw him more.

Musæ (*mū'zē*).—The Muses, daughters of Jupiter and Mnemosyne, were nine in number, and presided over the different kinds of poetry, the arts and sciences. Their names and special attributes were as follows: (i) Calliope (*kal-lī'o-pē*), the muse of epic poetry; (ii) Clio (*klī'ō*), of history; (iii) Erato (*er'a-tō*), of erotic poetry and mimic imitation; (iv) Euterpe (*ū-ter'pē*), of lyric poetry; (v) Melpomene (*mel-pom'-en-ē*), of tragedy; (vi) Polyhymnia (*pol-i-him'ni-a*), of the sublime hymn; (vii) Terpsichore (*terp-sik'o-rē*), of choral song and dancing; (viii) Thalia (*tha-lī'a*), of comedy; and (ix) Urania (*ū-rā'ni-a*), of astronomy. The favorite haunt of the Muses was Mount Helicon in Bœotia, where were the sacred fountains of Aganippe and Hippocrene. Mount Parnassus was also sacred to them.

Myrmidones (*mer-mid'on-ēz*), or **Myrmidons** (*mer'-mid-ons*).—A people of Thessaly, under the rule of Achilles, whom they accompanied to Troy.

Myrtilus (*mer'til-us*).—Son of Mercury, and charioteer of Œnomaus. See "Pelops."

Mysterious Three, The.—In Scandinavian mythology were Har 'the Mighty," the "Like-Mighty," and the "Third Person," who sat on three thrones above the rainbow. Then came the Æsir, of which Odin was chief, who lived in Asgard (between the rainbow and earth); next came the Vanir, or gods of the ocean, air, and clouds, of which deities Niörd was chief.

N

Naiades (*nā'i-a-dēz*), or **Naiads** (*nā'yadz*).—The nymphs of freshwater. See "Nymphæ."

Naraka.—The hell of the Hindus. It has twenty-eight divisions, in some of which the victims are mangled by ravens and owls; in others they are doomed to swallow cakes boiling hot, or walk over burning sands.

Narcissus (*nar-sis'us*).—A beautiful youth, inaccessible to the feeling of love. The nymph Echo fell in love with him, but, her love not being returned, she pined away in grief (see "Echo"). In order to punish him, Nemesis made him see his own reflected image in a fountain, whereupon he became so enamored of it that he gradually pined away until changed into the flower that bears his name.

Nausicaa (*naw-sik'a-a*).—Daughter of Alcinous, who conducted Ulysses, when shipwrecked on the coast of Scheria (an island), to her father's court.

Neleus (*nē'lūs*).—Son of Neptune and the nymph Tyro; king of Pylos, in Peloponnesus, and father of Nestor (*q.v.*).

Nemea (*ne-mē'a*).—A city in Argolis, near which Hercules slew the Nemean lion.

Nemesis (*nem'e-sis*)—*i. e.* vengeance (Gr.).—The goddess of retribution, who brings down all immoderate good fortune. She was also regarded as the goddess who punished crimes. She was the daughter of Night, and was represented as a crowned virgin, of great beauty and grace, with a whip in one hand and a pair of scales in the other.

Neoptolemus (*ne-op-tol'em-us*).—Son of Achilles and Deidamia. He was also called Pyrrhus (*pir'us*), on account of his reddish hair (Gr.); his other name, Neoptolemus, which signifies *New-to-war* (Gr.), having been given to him because he *came late to Troy*. He displayed great valor at Troy, and was one of the heroes concealed in the wooden horse (see "Troy"). He slew Priam and his daughter Polyxena. At the distribution of captives Andromache, the widow of Hector, fell to his lot, and he took her to Epirus. He married Hermione, the beautiful daughter of Menelaus and Helen, but was slain by Orestes, to whom she had been previously promised.

Neptunus (*nep-tū'nus*), or **Neptune;** called Poseidon (*po-sī'don*) by the Greeks.—The god of the sea and other waters, the brother of Jupiter, and husband of Amphitrite. His palace was in the depth of the sea near Ægæ, in Eubœa, where he kept his horses with brazen hoofs and golden manes, which drew his chariot over the waves of the sea. His celebrated contest with Minerva for the possession of Athens is narrated under "Athenæ." In the Trojan war he sided with the Greeks. He not only created the horse, but also taught men the art of managing horses by the bit and bridle. The symbol of his power was a trident, or spear with three prongs, with which he called forth or hushed storms, shook the earth, etc. Besides the trident, his attributes are the dolphin and the horse.

Nereides (*nē're-i-dēz* or *nē-rē'id-ēz*); the Nereids (*nē'-re-ids*).—The fifty daughters of Nereus and Doris. They were the marine nymphs of the Mediterranean (see "Nymphæ"). Thetis, the mother of Achilles, was a Nereid.

Nereus (*nē'rūs*).—Son of Pontus and Gæa, and husband of Doris, father of the fifty Nereids. He dwelt at the bottom of the sea, and was regarded as the wise old man of the sea. Like other marine divinities, he was supposed to have the power of prophesying the future, and of appearing to mortals in various shapes. The Ægean Sea was his empire—possibly the whole of the Mediterranean.

Nessus (*ness'us*).—A Centaur who was slain with a poisoned arrow by Hercules (*q.v.*).

Nestor (*nes'tor*).—Son of Neleus and king of Pylos. He was famous among the heroes before Troy for his wisdom, justice and eloquence. In early life he was a distinguished warrior, and took part in the fight between the Centaurs and the Lapithæ, and was one of the Calydonian hunters and one of the Argonauts. He is said to have lived through three generations of men. He safely reached Pylos again after the fall of Troy.

Nicneven.—A gigantic and malignant female spirit of the old popular Scottish mythology. The hag is represented as riding at the head of witches and fairies at Hallowe'en.

Nidhogg.—The dragon that gnaws at the root of Yggdrasil, the tree of the universe in Scandinavian mythology.

Niflheim.—Mist-home of old Norse mythology. The region of endless cold and everlasting night, ruled over by Hela. It consists of nine worlds, to which are consigned those who die of disease or old age. This region existed "from the beginning" in the north, and in the middle thereof was the well Hvergelmir, from which flowed twelve rivers.

Niobe (*nī'o-bē*).—Daughter of Tantalus and wife of Amphion, king of Thebes. Having seven sons and seven daughters, she imprudently boasted of her superiority to Latona, who had but two children—Apollo and Diana. The latter, indignant at her presumption, slew all her children with their arrows. Niobe herself was changed into a stone.

Niord.—The Scandinavian sea-god. He was not one of the Æsir. Niord's son was Frey (the fairy of the clouds), and his daughter was Freyja. His home was Noatun. Niord was not a sea-god like Neptune, but the spirit of water and air. The Scandinavian Neptune was Ægir, whose wife was Skadi. His temples were near the seashore and all aquatic plants belonged to him.

Nisus (*nī'sus*).—A friend of Euryalus (*ū-rī'a-lus*).—The two accompanied Æneas to Italy, and perished in a night attack on the Rutulian camp.

Nix.—Little creatures not unlike the Scotch brownie and German kobold. They wear a red cap, and are ever ready to lend a helping hand to the industrious and thrifty.

Nokomis.—Daughter of the moon, American Indian myths. Sporting one day with her maidens on a swing made of vine canes, a rival cut the swing, and Nokomis fell to earth, where she gave birth to a daughter named Wenonah.

Nornir, or **Norns.**—The three fates of Scandinavian mythology, past, present, and future. They spin the events of human life, sitting under the ash-tree Yggdrasil which they carefully tend. Their names are Urda (the past), Verdandi (the present), and Skuld (the future). Besides these three Norns, every human creature has a personal Norn or fate. The home of the Norns is called in Scandinavian mythology Doomstead.

Notus (*nō'tus*) (Gr.); called Auster by the Romans. —The south or southwest wind.

Nox (*noks*); called Nux (*nūks*) by the Greeks.—Night, daughter of Chaos.

Numitor (*nū'mi-tor*).—A king of Alba, grandfather of Romulus and Remus.

Nymphæ (*nim'fē*), or **Nymphs.**—Lesser female divinities supposed by the Greeks to dwell in the sea, springs, rivers, grottoes, trees and mountains. They had distinctive names, according to their habitat, as follows:

(i) The sea-nymphs, which were divided into two classes—the Oceanides (*ō-se-an'id-ēz*), or Nymphs of the Ocean, who were daughters of Oceanus (*ō-sē'an-us*); and the Nereides (*nē're-id-ēz* or *nē-rē'id-ēz*), or Nereids (*nē're-ids*), the nymphs of the Mediterranean, who were the daughters of Nereus.

(ii) The nymphs of fresh-water (rivers, lakes, brooks or springs); called Naiades (*nā'i-a-dēz*), or Naiads (*nā'yads*).

(iii) Oreades (*o-rē'ad-ēz*), the nymphs of mountains and grottoes.

(iv) Napææ (*na-pē'ē*), the nymphs of glens.

(v) Dryades (*drī'ad-ēz*), or Dryads, and Hamadryades (*ham-a-drī'ad-ēz*), the nymphs of trees; these nymphs died with the trees that had been their abode, and with which they had come into existence.

Nysa (*nī'sa*).—A city in India, where Bacchus was brought up.

O

Oceanus (*ō-sē'an-us*).—Son of Heaven and Earth, the god of the water that was supposed to surround the whole earth, the husband of Tethys, and the father of all the river-gods and water-nymphs of the whole earth. The ancient Greeks imagined the earth to be flat and circular, and to be surrounded by a river, which flowed perpetually around it, and which they called Oceanus. It was the great Outward Sea, opposed to the Inward or Mediterranean.

Odhærir.—In Scandinavian mythology the mead or nectar made of Kvasir's blood, kept in three jars. The second of these jars is called "Sohn," and the third "Bohn." Probably the nectar is the "spirit of poetry."

Odin.—The king of gods and men, and the reputed progenitor of the Scandinavian kings. He corresponds both to the Jupiter and the Mars of classical mythology. As god of war, he holds his court in Valhalla, surrounded by all warriors who have fallen in battle, and attended by two wolves, to whom he gives his share of food; for he himself lives on wine alone. On his shoulders he carries two ravens, Hugin (mind) and Munin (memory), whom he dispatches every day to bring him news of all that is doing throughout the world. He has three great treasures, namely, Sleipnir, an eight-footed horse of marvelous swiftness; Gungnir, a spear, which never fails to strike what it is aimed at; and Draupnir, a magic ring, which every ninth night drops eight other rings of equal value. The German tribes worshiped Odin under the name of "Woden." The fourth day of the week, Wednesday, was sacred to him.

Odur.—In Scandinavian mythology, husband of Freyja, whom he deserted. He abandoned his wife on her loss of youth and beauty, and was punished.

Odysseus (*od-is'sūs*).—The Greek form of Ulysses, king of Ithaca, whose return from Troy to Ithaca forms the subject of the Odyssey. See "Ulysses."

Œneus (*ē'nūs*).—King of Pleuron and Calydon, in Ætolia, husband of Althæa, and father of Meleager, Deianira, and other children. During his reign the boar that laid waste the lands of Calydon gave rise to the celebrated Calydonian boar hunt.

Œnone (*ē-nō'nē*).—Wife of Paris of Troy, before he carried off Helen.

Oileus (*o-ī'lūs*).—King of the Locrians, father of the lesser Ajax, and one of the Argonauts.

Olympia (*o-lim'pi-a*).—A plain in Elis, where the Olympian games were held. In the plain was the sacred grove of Jupiter, which contained the masterpiece of Greek art—the colossal statue of Jupiter by Phidias. The Olympic games were held every four years, this interval being called an Olympiad.

Olympus (*o-lim'pus*).—A mountain range on the boundary of Macedonia and Thessaly, of great height, and consequently regarded as the abode of the gods. Once the giants tried to reach heaven, and to do so piled Mount Pelion on Mount Ossa (both being high mountains in the neighborhood of Olympus); but Jupiter used his thunderbolts against them, and, with the assistance of Hercules, destroyed them all, and buried them under Mount Ætna.

Omphale (*om'fa-lē*).—A queen of Lydia, whom Hercules served as a slave a short time. She put on his lion's skin, and carried his club, whilst he donned woman's attire and spun wool.

Ops.—Wife of Saturn, the goddess of plenty and fertility, and especially the patroness of husbandry.

Oreades.—See "Nymphæ."

Orestes (*o-res'tēz*).—Son of Agamemnon and Clytæmnestra, who, on the murder of Agamemnon, after his return from Troy, by Clytæmnestra and her paramour Ægisthus, was saved from the same fate by his sister Electra. He went to Strophius, king of Phocis, who was the husband of his aunt Anaxibia. Here he formed a memorable friendship with Pylades (*pi'la-dēz*), the king's son. Later he avenged his father's death by slaying his mother and Ægisthus; but was, in consequence, seized with madness and wandered from place to place. Apollo told him he could recover from his madness only by bringing the statue of Diana from the Tauric Chersonesus. Accordingly he set out, in company with his friend Pylades; but on their arrival they would have been sacrificed by the Tauri (*q.v.*) to Diana had not Orestes' sister Iphigenia, who was the priestess of Diana, recognized him and intervened in time to save their lives. All three then escaped with the statue of the goddess. After this Orestes became king of Mycenæ, his father's kingdom, and married the beautiful Hermione, daughter of Menelaus and Helen (of Troy), after slaying Neoptolemus (*q.v.*).

Orion (*o-rī'on*).—A handsome giant and hunter. He was beloved by Diana, which so displeased Apollo that he asserted that she was unable to hit, with one of her arrows, a distant point he showed her in the sea. This point was the head of Orion, who was swimming in the sea. Thus Orion perished, and he was placed among the stars, where he appears as a giant with a girdle, sword, a lion's skin, and a club.

Orlog.—A god of Norse fable personifying the eternal law of the universe, from whose decree there was no appeal.

Ormuzd.—The name of the supreme deity of the ancient Persians, and of their descendants, the Parsees and Ghebers. He is an embodiment of the principle of good, and was created by the will of the great eternal spirit, Zervan-Akharana, simultaneously with Ahriman, the principle of evil, with whom he is in perpetual conflict. Ormuzd is the creator of the earth, sun, moon, and stars, to each of which he originally assigned its proper place, and whose various movements he continues to regulate.

Orpheus (*or'fe-us*).—A pre-Homeric poet, son of Œagrus and Calliope, lived in Thrace, and accompanied the Argonauts in their celebrated expedition. He played so skillfully on the lyre, which had been presented to him by Apollo, and which he had been taught to play by the Muses, that not only were wild beasts made tame, but even the rocks and trees moved from their places to follow him. He married the nymph Eurydice (*ū-rid'is-ē*), who died from the bite of a snake. He followed her into the lower world, where his beautiful strains of music even suspended the punishment of the wicked. Pluto promised to yield back his wife to him on the condition that he did not look back until he arrived in the upper world again. At the very moment, however, of passing the fatal bounds, Orpheus glanced back to see if she were following him, and just beheld her snatched back into the infernal regions. His grief for the loss of Eurydice was such that he treated all the Thracian women with contempt, and they in revenge, during the Bacchanalian orgies, tore him to pieces.

Ortygia (*or-tij'i-a*).—The ancient name of Delos, where Apollo and Diana were born.

Osiris (*o-sī'ris*).—A great deity of the Egyptians, husband of Isis. The ancients differ in opinion concerning this celebrated god, but they all agree that as ruler of Egypt he took care to civilize his subjects, to improve their morals, to give them good and salutary laws, and to teach them agriculture. He was worshiped under the form of an ox.

Ossa (*os'sa*).—A celebrated mountain in the northeast of Thessaly, near Mount Olympus. When the giants tried to scale heaven, they heaped Pelion, another mountain, on Ossa in order to reach the lofty mount Olympus, on the top of which Jupiter and the other gods dwelt.

P

Pæan (*pē'an*)—*lit.* "physician" (Gr.).—The name of the physician of the gods. Later the name was transferred to Apollo, and afterwards it was applied to a choral song, hymn or chant addressed to Apollo, and also to a war song before battle or after a victory.

Pagasæ (*pag'a-sē*), or **Pagasa.**—A maritime town of Thessaly, where the Argo (see "Argonautæ") was built.

Paimosaid.—In American Indian myths a walking thief, especially one who walks through cornfields about harvest time to pluck the ears of maize or corn.

Palæmon (*pal-ē'mon*).—A sea-god; originally called Melicerta (*q.v.*).

Palamedes (*pal-a-mē'dēz*).—Son of Mauplius, and one of the Greek heroes who sailed against Troy. Having exposed Ulysses (*q.v.*) when he feigned madness in order to avoid going to Troy, the latter, who was famous for his craft, revenged himself by contriving to get a letter, purporting to be written by Priam, king of Troy, concealed under Palamedes' bed. Ulysses then accused Palamedes of treachery, the fatal letter apparently established the charge, and Palamedes was stoned to death by the Greeks. Palamedes is credited with having added four letters— θ, ξ, χ, Φ—to the original Greek alphabet of Cadmus, and also with the invention of quoits, dice, lighthouses, measures, scales, etc.

Pales (*pal'ēz*).—The Roman protecting deity of flocks and shepherds.

Palici (*pal-i'sī*).—Twin sons of Jupiter and the nymph Thalia. They were worshiped in Sicily, in the neighborhood of Mount Ætna.

Palinurus (*pal-i-nū'rus*).—The pilot of Æneas, who fell into the sea off the west coast of Lucania.

Palladium (*pal-lad'i-um*).—Properly any statue of Pallas—*i. e.* Minerva; but *the* Palladium was an ancient image of the goddess at Troy, on the preservation of which the safety of the city was supposed to depend. Ulysses and Diomedes succeeded in carrying it off and afterwards took it to Greece. See "Troy."

Pallas (*pal'las*).—The Greek name of Minerva (*q.v.*).

Pan.—The chief god of shepherds and flocks; son of Mercury, and the inventor of the syrinx or shepherd's flute. He was also god of woods, in which he dwelt, and occasionally appeared suddenly before travelers, whose consequent fright was hence called "Panic fear." Pan is usually represented as a being with horns, pucknose and goat's legs and feet.

Pandarus (*pan'da-rus*).—A celebrated archer in the Trojan army.

Pandora (*pan-dō'ra*)—*lit.* "giver of all" (Gr.).—A beautiful woman, made by Vulcan at Jupiter's command, *who received presents from the gods*—hence her name. She was the first woman on earth, and was designed to work the ruin of man in revenge for Prometheus having stolen fire from heaven and thus benefited mankind against the will of Jupiter. Venus adorned her with beauty, Mercury endowed her with boldness and cunning, and the gods, each and all, provided her with a combination of destructive powers wherewith to work out the ruin of man. Thus provided, Mercury took her to Epimetheus (*i. e.* afterthought), who made her his wife, forgetting, till *too late*, that his brother Prometheus (*i. e.* forethought) had strictly enjoined him not to receive any gifts from the gods. Pandora brought with her from heaven a box containing every human ill, which, with feminine curiosity, she opened, and out of it they all flew, to afflict mankind, Hope alone remaining.

Paphos (*paf'os*).—A town in Cyprus; the chief seat of the worship of Venus.

Parcæ (*par'sē*).—The Fates; called by the Greeks Moiræ (*moy'rē*).—They were three in number; and their names were:

(i) Clotho (*klō'tho*), the spinner of the thread of life.
(ii) Lachesis (*lak'e-sis*), the disposer of lots in life.
(iii) Atropos (*at'ro-pos*)—*lit.* "the inflexible"—the fate that cannot be avoided. To these mighty goddesses both gods and men must submit. Sometimes Atropos is represented as cutting the thread of life spun by Clotho.

Paris, usually called Alexander (*lit.* "defending men") in the *Iliad*. The second son of Priam, king of Troy, and Hecuba. He was brought up on Mount Ida by a shepherd, who gave him the name Paris. He was afterwards called Alexander on account of the bravery he displayed in defending the flocks and shepherds. He married Œnone (*ē-nō'nē*), the daughter of the river-god Cebren. He soon deserted her, however, in the following manner: At the marriage of Peleus and the Nereid Thetis all the gods, with the single exception of the goddess of Discord, were invited. Annoyed at being thus passed over, she threw among the guests a golden apple—usually called the Apple of Discord—with the inscription, "To the fairest." Three were claimants for it—Juno, Venus and Minerva. Jupiter ordered Mercury to take the three goddesses to Mount Ida, and submit the matter to the judgment of the shepherd Paris, hence giving rise to the celebrated "Judgment of Paris," which has formed the subject of so many masterpieces of art. In order to influence him in their favor severally, Juno promised him the sovereignty of Asia, Minerva renown in war, and Venus the most beautiful woman in the world for his wife. Paris decided in favor of Venus, and awarded her the golden apple. He then, under the guidance of Venus, sailed for Greece, to the court of Menelaus, king of Sparta, whose wife, Helen, was the most beautiful of women. He succeeded in carrying Helen off, and so gave rise to the famous Trojan war, as all the chiefs in Greece joined with Menelaus in an expedition to fetch her back from Troy (see "Helena"). Paris fought with Menelaus before the walls of Troy, and would have been slain by him, had not Venus interposed and carried him off in a cloud. He was killed by the celebrated archer Philoctetes, who shot him with one of the poisoned arrows of Hercules. When wounded he returned to his long-neglected wife Œnone, and requested her to heal the wound; but she refused, and he died in consequence. Œnone soon repented, however, and put an end to her own life. During the Trojan war Paris killed Achilles (*q.v.*).

Parnassus (*par-nas'sus*).—A high mountain in Phocis (Greece), with two peaks, sacred to Apollo and the Muses. Near it was the town of Delphi; and on the mountain was the famous Castalian spring, also sacred to Apollo and the Muses, in which the Pythia, the priestess, at Delphi, used to bathe.

Parthenopæus (*par'then-o-pē'us*).—Son of Meleager and Atalanta, and one of the "Seven against Thebes."

Parthenope (*par-then'o-pē*).—One of the Sirens (*q.v.*), and the name of an ancient city forming the site of the present city of Naples (Neapolis).

Pasiphae (*pā-sif'a-ē*).—Daughter of the Sun and Perseis, wife of Minos and mother of Androgeos, Ariadne and Phædra; also of the Minotaur (see "Minos").

Patroclus (*pa-trok'lus*).—The beloved friend of Achilles. Whilst Achilles remained inactive during part of the Trojan war, Patroclus was allowed by Achilles to lead the latter's Myrmidons against the Trojans at a critical time. Achilles, in order to enhance the effect, equipped him with his own armor and arms. Patroclus, whom the Trojans supposed to be Achilles himself, drove them back to the walls of Troy, where, however, he was slain by Hector. To avenge his death, Achilles quickly reappeared in the field, and slew Hector in single combat.

Pauguk.—Name given to the great power, death, in American Indian mythology.

Pau-Puk-Keewis.—In American Indian folk-lore a mischievous magician, who is pursued by Hiawatha, goes through a series of wonderful transformations in his endeavors to escape, and finally becomes an eagle.

Peboan.—In American Indian folk-lore the personification of winter in form of a great giant who shook the snow from his hair and turned water into stone by his breath.

Pegasus (*peg'a-sus*).—The winged horse which sprang from the blood of the Gorgon Medusa, when her head was struck off by Perseus (*q.v.*). It was named Pegasus from *the springs* of Ocean, near which Medusa was killed. With a blow of his hoof he caused the fountain of the Muses (Hippocrene) to spring from Mount Helicon. Bellerophon rode him when he slew the Chimæra (*ki-mē'ra*).

Peleus (*pē'lūs*).—Son of Æacus, king of the Myrmidons in Thessaly, husband of Thetis and father of Achilles. The Nereid Thetis, who was his second wife, had the power, possessed also by Proteus, of assuming any form she pleased, a power she exercised in order to escape from Peleus. But the latter, having been taught by Chiron, held the goddess fast till she promised to marry him. At their marriage all the gods, save one, were present, and the uninvited one, the goddess of strife, threw the celebrated golden apple among the guests (see "Paris"). Peleus survived the death of his famous son Achilles.

Pelias (*pe'li-as*).—King of Ioclus, in Thessaly. In order to get rid of his nephew Jason, who claimed the throne, he sent him to fetch the golden fleece, thus giving rise to the celebrated expedition of the Argonauts (see

"Argonautæ"). When Jason returned with Medea, the latter persuaded the daughters of Pelias to cut him in pieces and boil him, with the idea of thus restoring him to youth and vigor. In this way he perished. See "Jason."

Pelion (*pē'li-on*).—A lofty range of well-wooded mountains in Thessaly. The giants heaped it on Mount Ossa, in their attempt to scale heaven (see "Ossa" and "Olympus"). The Centaur Chiron dwelt in a cave near its summit. The Argo (see "Argonautæ") was built from timber felled here.

Pelops (*pē'lops*).—Son of Tantalus, king of Phrygia, father of Atreus and Thyestes, grandfather of Agamemnon and Menelaus. When a boy he was cut in pieces and boiled to make a savory dish to set before the gods, whom Tantalus, the favorite of the gods, had invited to a repast; but the gods would not touch it, and ordered Mercury to again put him into a caldron, whereby he was restored to life. Being driven out of Phrygia, he went to Elis, a province of Peloponnesus, and there obtained the hand of Hippodamia, daughter of King Œnomaus, whom he succeeded on the throne. He afterwards became so powerful that the whole peninsula was called after him "the island of Pelops." In order to gain Hippodamia (*hip-po-da-mī'a*) he had first to engage in a chariot race with Œnomaus (*ē-nom'-a-us*), a condition which the latter imposed on every suitor for his daughter's hand, as an oracle had declared that he would be killed by his son-in-law. His horses being swifter than those of any mortal, many a suitor had suffered death, the stipulated penalty of defeat. Pelops, however, bribed Myrtilus, the charioteer of Œnomaus, to remove the linchpins of his master's chariot, the bribe being the promise of half the kingdom. In the race the wheels of Œnomaus' chariot soon came off, and Œnomaus was thrown out, and killed. Pelops thus gained Hippodamia, but was unwilling to keep faith with Myrtilus, whom he threw from a cliff into the sea.

Penates (*pē-nā'tēz*).—Old Latin guardian deities both of a household and of the state. The images of these gods were kept in the penetralia (*pen-e-trā'li-a*)—that is, the *innermost* or central part of the house. The Lares (*q.v.*) formed part of the Penates. On the hearth a perpetual fire was kept up in their honor, and the table, which was also sacred to them, always contained the salt-cellar and offerings of first fruits for them.

Penelope (*pe-nel'o-pē*).—The wife of Ulysses; celebrated for her constancy to her husband during his twenty years' absence from Ithaca. She was the daughter of Icarius and Peribœa, of Sparta, and was won by Ulysses in the following way: Her father promised her to the suitor who should win a foot-race; but when Ulysses was the successful competitor her father tried to persuade her not to leave him. Ulysses left her free to act as she pleased in the matter, whereupon she covered her face with her veil to hide her blushes, and thus intimated that she preferred to accompany him as her husband. By Ulysses she became the mother of an only child, Telemachus. During Ulysses' long absense she was the object of much undesired attention on the part of a host of importunate suitors, who declared that Ulysses must surely be dead. Penelope at last promised to make a selection of one of their number to be her husband as soon as she had finished a robe she was making for Ulysses' aged father, Laërtes (*lā-er'tēz*). This was only a ruse (generally referred to as "Penelope's web"), however, to put them off, as she undid every night the work done during the day. At last the secret was betrayed by one of her servants, and she was importuned more than ever. Ulysses now arrived home after twenty years' absence at Troy and his subsequent celebrated wanderings, and came at first disguised as a beggar to see how the land lay. Having soon ascertained his wife's noble fidelity, he still further tested her by getting her to promise her hand to the suitor who could draw his bow. This none of them could do, so Ulysses took it up and slew them all. He then made himself known to Penelope, and went to see his aged father.

Peneus (*pē-nē'us*).—The principal river of Thessaly, which flows in the valley of Tempe, between Mount Pelion and Mount Ossa, into the sea; also the river-god, who was the father of Daphne and Cyrene.

Penthesilea (*pen-thes-i-lē'a*).—The young and beautiful queen of the Amazons, who fought against the Greeks before Troy, and was slain by Achilles.

Pentheus (*pen'thūs*).—Grandson of Cadmus, whom he succeeded as king of Thebes. He was opposed to the introduction of the worship of Bacchus into his kingdom, and in consequence was torn to pieces by his mother and her sisters, who in their Bacchic frenzy imagined him to be a wild beast.

Perdix (*per'diks*).—The nephew of Dædalus (*q.v.*), the inventor of the chisel, saw, compasses, etc.

Peri.—Peris are delicate, gentle, fairy-like beings of eastern mythology, begotten by fallen spirits. They direct with a wand the pure in mind the way to heaven. These lovely creatures, according to the Koran, are under the sovereignty of Eblis; and Mohammed was sent for their conversion, as well as for that of man.

Persephone (*per-sef'on-ē*).—The Greek name for Proserpina (*q.v.*).

Perseus (*per'sūs*).—Son of Jupiter and Danaë (*q.v.*). His most heroic deed was the slaying of the Gorgon Medusa, which he accomplished in the following manner: With the aid of Mercury and Minerva he possessed himself of the winged sandals, the magic wallet, and the helmet of Pluto, which rendered the wearer invisible, and further received from Mercury a sickle, and from Minerva a mirror. Thus provided, he rose into the air and made his way to the abode of the Gorgons. He found them asleep, and cut off with the sickle the head of Medusa, looking at her terrible form in the mirror, as a single glance would have immediately changed him into stone. Perseus placed her head in the magic wallet, which he carried on his back, and escaped in safety from the pursuit of the two other Gorgons, the helmet rendering him invisible. He then proceeded to Æthiopia, where he slew the sea-monster, and saved and married the beautiful Andromeda (*q.v.*). The latter having been previously promised, however, to her uncle Phineus, he and several armed companions made their appearance at the nuptials, and endeavored to carry off the bride; but Perseus brought out Medusa's head, and they were all turned into stone. Perseus afterwards gave the head of Medusa to Minerva, who placed it in the middle of her breastplate or shield. In fulfillment of the oracle he accidentally killed his grandfather Acrisius (*q.v.*) with a quoit. He is said to have founded Mycenæ.

Phæaces (*fē-ā'sēz*).—A fabulous people represented in the *Odyssey* as inhabiting the island of Scheria (afterwards Corcyra; now Corfu), and famous as sailors. Alcinous (*q.v.*) was their king.

Phaethon (*fā'e-thon*)—*lit.* "the shining" (Gr.).—Son of the sungod (Apollo) and Clymene (*klī'men-ē*). Having obtained permission from his father to drive the chariot of the sun across the heavens for one day, he drove so near the earth that he almost set it on fire, his strength being insufficient to keep the horses in the right track. Consequently Jupiter hurled him down with a thunderbolt into the river Padus (Po).

Phaon (*fā'ōn*).—A boatman at Mytilene, who, originally an ugly old man, was made young and handsome by Venus, whom he had carried across the sea without payment. Sappho (*q.v.*) thus fell in love with him, and, on her love not being returned, threw herself into the sea.

Philoctetes (*fil-ok-tē'tēz*).—A very famous archer, a friend of Hercules, who gave him at his death the poisoned arrows without which Troy could not be taken. In the tenth year of the Trojan war he was specially fetched from Lemnos, where he had been detained by a wound, by Ulysses and Diomedes. On arriving at Troy, Æsculapius or his sons cured his wound. He slew Paris and other Trojans.

Phlegethon (*fleg'e-thon*)—*lit.* "the blazing" (Gr.).—A river in the lower world, which ran with fire instead of water.

Phœbe (*fē'bē*).—A feminine form of Phœbus (*lit.* "the bright one"); applied to Diana, the sister of Apollo, as the goddess of the moon.

Phœbus (*fē'bus*)—*lit.* "the bright one" (Gr.).—An epithet applied to Apollo as the god of the sun. See "Apollo."

Phœnix (*fē'nix*).—(i) A fabulous bird described as being as large as an eagle; its head finely crested with a beautiful plumage, its neck covered with gold-colored feathers, its tail white, and its body purple or crimson. (ii) Son of Amyntor, the teacher of Achilles, and his companion during the Trojan war.

Phorcys (*for'sis*), or **Phorcus** (*for'kus*).—A sea-god, father of the Gorgons and of the Grææ.

Phrixus (*frix'us*).—Son of Athamas and Nephele. Athamas having neglected Nephele (*nef'el-ē*), and married Ino, the latter persuaded him to sacrifice Nephele's son Phrixus to Jupiter. Nephele, however, enabled her two children, Phrixus and Helle, to escape by means of a ram with golden fleece, the gift of Mercury, which carried them through the air. Helle fell into the sea (see "Helle"), but Phrixus arrived safely in Colchis, the kingdom of Æëtes (*q.v.*). Here he sacrificed the ram to Jupiter, and gave its golden fleece to Æëtes, who suspended it to an oak tree in the grove of Mars. To fetch this golden fleece the famous expedition of the Argonauts (see "Argonautæ") was undertaken.

Picus (*pī'kus*).—Son of Saturn and father of Faunus. He was changed by Circe into a woodpecker, because he did not requite her love. The Romans regarded the woodpecker as a prophetic bird, sacred to Mars.

Pieria (*pī-er'i-a*).—A district of Macedonia, in the north of Greece; celebrated as one of the earliest seats of the worship of the Muses, who are hence called Pierides (*pī-er'id-ēz*). Hence the following lines:—

"A little learning is a dangerous thing;
Drink deep, or taste not the Pierian spring."
Pope's *Essay on Criticism.*

Pirene (*pī-rē'nē*).—A noted fountain at Corinth, at which Bellerophon caught Pegasus.

Pirithous (*pī-rith'o-us*).—Son of Ixion, whom he succeeded as king of the Lapithæ; famous for his friendship with Theseus. When Pirithous was invading Attica he was opposed by Theseus, king of Athens, for whom he soon conceived feelings of admiration, which afterwards deepened into a lasting friendship. At the marriage of Pirithous with Hippodamia (*hip-po-da-mī'a*) the bride was seized by a drunken Centaur, and thus arose the celebrated fight between the Centaurs and Lapithæ (*q.v.*), in which, with the assistance of Theseus, Pirithous and the Lapithæ came off victorious. On the death of Hippodamia, Pirithous conceived the bold project of carrying off Proserpine, wife of Pluto. Accordingly the two friends descended into the lower world, but were seized by Pluto and chained to a rock, where they both remained till Hercules visited that region. Hercules then delivered Theseus, who was suffering punishment merely on account of his friendship for Pirithous; but the latter he left to his fate.

Pleiades (*plē'ya-dēz*).—The seven daughters of Atlas and Pleione (*plē'yo-nē*).—They were the virgin companions of Diana, and when pursued by Orion were changed into doves and placed among the stars.

Pluto (*plū'tō*).—The god of the nether world; originally called Hades (*hā'dēz*), the name Pluto (*lit.* "wealth") being applied to him because corn, the *wealth* of early times, was sent from beneath the earth as his gift. He was the son of Saturn and Rhea, brother of Jupiter and Neptune, and the husband of Proserpine. He possessed a celebrated helmet, which rendered the wearer invisible, and which Perseus (*q.v.*) borrowed when he went to slay the Gorgon Medusa. Black sheep were sacrificed to him. Pluto was also called Dis (*dīs*) and Orcus (*or'-kus*).

Plutus (*plū'tus*).—The god of wealth; represented as blind.

Pluvius (*plū'vi-us*)—*lit.* "rain-bringing" (Lat.).—A surname of Jupiter, to whom sacrifices were offered in times of drought. See "Jupiter."

Pollux.—See "Castor."

Polyhymnia.—See "Musæ."

Polyphemus (*pol-i-fē'mus*).—Son of Neptune; was one of the celebrated Cyclops living in Sicily. He was a huge monster, having but one eye in the center of his forehead, and ate human flesh. Being rejected by the nymph Galatea in favor of Acis, he crushed the latter under an enormous rock. Ulysses, during his wanderings on his journey homeward after the fall of Troy, was driven upon Sicily, and at once seized by Polyphemus, who shut him and his companions in the great cave in which he dwelt. In the evening he drove his flock into the cave, closed the mouth of the cave with a heavy rock, and ate two of Ulysses' companions for his supper. The next morning he led his sheep out to pasture, closing the mouth of the cave after him. The wily Ulysses then contrived and successfully carried out the following plan of escape: When the monster returned in the evening, Ulysses offered him some wine he had brought with him, and gave him enough to make him intoxicated. Polyphemus asked Ulysses his name, and the latter gave that of Noman. The giant then fell asleep, whereupon Ulysses and his companions, having made everything ready, bored out his eye with a red-hot piece of timber. Polyphemus roared out, and the other Cyclops dwelling on the island came to the mouth of the cave and inquired what was the matter; Polyphemus replied that *no man* had injured him, whereupon they all went away. Even now, however, Ulysses could not escape, the cave being closed by such a heavy rock, and had to wait till the following morning. Polyphemus then removed the rock, but sat by the opening and felt the back of each sheep as it passed out. Ulysses, whose name is synonymous with craft itself, had foreseen this, however, and he and his six companions safely passed out by clinging to the wool on the bellies of the sheep. They then made their way to their ships, and quickly put out from the shore. When a little way out Ulysses derided Polyphemus, whereupon the latter threw several immense rocks after him, one of which nearly struck his ship. See *Odyssey*, Book IX.

Polyxena (*pol-ix'en-a*).—Daughter of Priam and Hecuba. She was beloved by Achilles, and sacrificed at the grave of the latter by his son Pyrrhus.

Pomona (*pō-mō'na*).—The goddess of fruit and fruit trees. Her name is derived from Lat. pomum, fruit (of any kind).

Ponemah.—In American Indian mythology the name of the land of the future life, or the spirit land.

Portunus (*por-tū'nus*), or **Portumnus** (*por-tum'nus*).—The protecting god of harbors.

Poseidon (*po-sī'don*).—See "Neptune."

Priam (*prī'am*).—Son of Laomedon, the famous king of Troy at the time of the Trojan war. The name Priam (Gr.) means the Chief, or Leader. He was the husband of Hecuba, and the father of Paris, Hector, Deiphobus, Cassandra, Polyxena, etc. On the capture of Troy he was slain by Pyrrhus, the son of Achilles.

Priapus (*pri-ā'pus*).—Son of Bacchus and Venus. The god of fruitfulness in general, and the protector of flocks of sheep and goats, of bees, of the vine, and of all garden produce.

Procas (*prō'kas*).—King of Alba Longa, and father of Numitor and Amulius.

Procne (*prok'nē*).—Sister of Philomela (*q.v.*).

Procris (*prō'kris*).—Wife of Cephalus (*q.v.*).

Procrustes (*prō-krus'tēz*)—*lit.* "the Stretcher" (Gr.).—The name of a famous robber of Greece, who used to make all his captives fit into his iron bed, either by cutting pieces off their legs if they were too long, or by stretching them out if they were too short. He was slain by Theseus.

Prometheus (*pro-mē'thūs*)—*lit.* "Foret hought" (Gr.).—Son of the Titan Iapetos, brother of Epimetheus (*ep-i-mē'thūs*), or "After-thought." The great benefactor of mankind, in spite of Jupiter. He stole fire from Olympus (heaven), and was the inventor of many arts, especially of working in metal and clay, whence he is said to have made man from clay. As a set-off against these advantages, Jupiter gave Pandora (*q.v.*) to Epimetheus. He also chained Prometheus to a rock, where in the daytime an eagle consumed his liver, which grew again during each succeeding night. From this perpetual torture he was delivered by Hercules, who killed the eagle.

Proserpina (*pro-ser'pin-a*); usually called **Proserpine** (*pros'er-pīn*); called by the Greeks Persephone (*per-sef'-on-ē*).—Daughter of Jupiter and Ceres, and queen of the lower world. Her father, unknown to her mother, promised her to Pluto, who carried her off by causing the earth to open beneath her as she was gathering flowers. In consequence of this, Ceres did not allow the earth to bring forth any fruits, and Jupiter was obliged to send Mercury into the lower world to fetch Proserpine back. Pluto allowed her to go, but first gave her a pomegranate to eat. Having thus eaten in the lower world, she was obliged to spend one-third of the year with Pluto, remaining during the other two-thirds with her mother (see "Ceres"). Pluto and Proserpine ruled over the souls of the dead in the lower world.

Proteus (*prō'tūs*).—A sea-god who had the power of assuming any form he pleased. He tended the flocks (seals) of Neptune, and at midday rose from the sea and slept in the shade of the rocks. At such times he was much sought after, his prophetic powers being highly valued. When seized by the person wishing to consult him, he, in order to escape, assumed several different shapes in succession; but, if firmly held, he speedily returned to his original form, and prophesied.

Psyche (*sī'kē*)—*lit.* "the soul" (Gr.).—The following beautiful story shows in an allegorical manner how the human soul is purified by misfortunes and prepared for the enjoyment of true and lasting happiness hereafter: Psyche was the youngest and most beautiful of the three daughters of a king, and by her beauty excited the jealousy of Venus. The goddess consequently ordered Cupid to inspire her with love for some utterly unworthy object; but instead of doing this Cupid himself fell in love with her. He accordingly visited her every night, leaving her always at daybreak. Her jealous sisters, however, made her believe that her midnight lover was a monster, and accordingly she one night brought a lamp while Cupid was asleep, and was astonished to behold the lovely god. In her excitement she let fall a drop of hot oil on the shoulder of Cupid, and so awoke him. He blamed her for her mistrust, and fled. In misery Psyche now wandered from temple to temple, inquiring after her lover, and at length came to the palace of Venus. Here she was treated with great severity and compelled to perform hard and menial tasks, which would have overcome her had not Cupid secretly and invisibly sustained her. At length she overcame the jealousy

of Venus, and, becoming immortal, was united to Cupid forever. In works of art Psyche is represented as a maiden with the wings of a butterfly.

Pukwana.—The smoke from the calumet or peace pipe among American Indians. The pipe was made from stone found near the headwaters of the Mississippi. A quarry, located near the mountains, was famous among the Indians, who had made the adjacent territory neutral ground. Here they came and provided themselves with pipes. To apply the stone to any other use than that of pipe-making would have been sacrilege in their mind. From the color, they even fancied it to have been made, at the great deluge, out of the flesh of the perishing Indian.

Puk-Wudjies.—The pygmies of American Indian folklore; little wild men of the woods.

Pygmalion (*pig-mā'li-on*).—King of Cyprus, who became enamored of an ivory statue which he had made. Venus having answered his prayer to her to breathe life into it, he married the maiden.

Pylades (*pi'la-dēz*).—Nephew of Agamemnon, and celebrated as the friend of Orestes (*q.v.*). He married Electra, the sister of Orestes.

Pyramus (*pi'ra-mus*).—The lover of Thisbe (*q.v.*).

Pyrrhus (*pir'us*).—See "Neoptolemus."

Python (*pī'thon*).—The famous serpent produced from the mud left after the subsidence of the deluge of Deucalion. It was slain near Delphi by Apollo, who founded the Pythian games to commemorate the victory.

Q

Quirinus (*kwi-rī'nus*).—The name of Romulus after his deification.

R

Rachaders.—In Indian mythology the second tribe of giants or evil genii, who had frequently made the earth subject to their kings, but were ultimately punished by Siva and Vishnu.

Radegaste.—In Slavonic mythology a tutelary god of the Slavi. The head was that of a cow, the breast was covered with an ægis, the left hand held a spear, and a cock surmounted its helmet.

Ragnarök (twilight of the gods).—The day of doom, when the present world and all its inhabitants will be annihilated. Vidar and Vali will survive the conflagration, and reconstruct the universe. In Scandinavian mythology the belief is taught that after this time the earth or realm will become imperishable and happiness sure.

Rahu.—In Hindu mythology the demon that causes eclipses. One day Rahu stole into Valhalla to quaff some of the nectar of immortality. He was discovered by the Sun and Moon, who informed against him, and Vishnu cut off his head. As he had already taken some of the nectar into his mouth, the head was immortal; and he ever afterward hunted the Sun and Moon, which he caught occasionally, causing eclipses.

Rakshas.—Evil spirits in Hindu myths, who guard the treasure of Kuvera, the god of riches. They haunt cemeteries and devour human beings; assume any shape at will, and their strength increases as the day declines. Some are hideously ugly, but others, especially the female spirits, allure by their beauty.

Ravana.—According to Indian mythology, was fastened down between heaven and earth for ten thousand years by Siva's leg, for attempting to move the hill of heaven to Ceylon. He is described as a demon giant with ten faces.

Ravens.—According to an oracle from the gods, delivered at ancient Athens, ravens prognosticate famine and death because they bear the characteristics of Saturn, the author of these calamities, and have a very early perception of the malign influence of that planet.

Remus (*rē'mus*).—The brother of Romulus (*q.v.*).

Rhadamanthus (*rad-a-man'thus*).—Son of Jupiter and Europa, and brother of Minos. He was one of the three judges in the lower world, the other two being Æacus and Minos.

Rhea (*rē'a*).—See "Cybele."

Rhea Silvia (*rē'a sil'vi-a*).—Daughter of Numitor, and mother of Romulus and Remus.

Rhesus (*rē'sus*).—A Thracian prince, who went to the assistance of Troy. As an oracle had declared that Troy would never be taken if the snow-white horses of Rhesus once drank of the Xanthus and fed on the grass of the Trojan plain. Diomedes and Ulysses slew Rhesus on the night of his arrival on Trojan territory, and carried off his horses.

Rhodope (*rod'o-pē*).—A lofty mountain range in Thrace, which, like the rest of Thrace, was sacred to Bacchus.

Romulus (*rom'u-lus*).—The founder and first king of Rome; twin-brother of Remus, son of Silvia by Mars. Silvia was the daughter of Numitor and a vestal virgin, hence the twins were condemned to be thrown into the Tiber. This was done; but the cradle stranded, and they were suckled by a she-wolf. They were afterwards found by Faustulus, the shepherd of king Amulius, who handed them over to the care of his wife Acca Larentia. When grown up, they decided to found a city on the Tiber; but in a dispute as to the site, Romulus killed Remus. When the city was built, it was found that women were very scarce. Romulus accordingly proclaimed that games were to be celebrated, and invited his neighbors, the Latins and Sabines, to the festival, during which the Roman youths carried off the maidens—this being generally referred to as "The Rape of the Sabine Women." Hence arose a war between the two peoples, which was brought to a termination by the Sabine women rushing in between the armies and praying them to be reconciled. After a reign of thirty-seven years, Romulus was taken up to heaven by his father Mars in a fiery chariot. He was then worshiped by the Romans as Quirinus (*kwi-rī'nus*).

S

Saga.—Goddess of history in Scandinavian mythology.

Salamander.—A fabulous animal supposed by the ancients to live in and have the quality of eating fire.

Salmoneus (*sal-mō'nūs*).—Son of Æolus and brother of Sisyphus. He presumed to imitate the thunder and lightning of Jupiter, and was consequently hurled down to Tartarus with a thunderbolt by the father of the gods.

Sarpedon (*sar-pē'don*).—(i) Son of Jupiter and Europa, king of the Lycians. Jupiter granted him the privilege of living three generations. (ii) Grandson of the preceding; assisted the Trojans in the Trojan war, but was slain by Patroclus.

Saturnus (*sā-tur'nus*); usually called **Saturn** (*sat'urn*); called by the Greeks Cronos.—A mythical king of Italy, whose reign was the "golden age." He was the son of Uranus (Heaven) and Gæa (Earth), the husband of Rhea, and the father of Jupiter, Juno, Pluto, Neptune, etc. He was the god of agriculture and of civilization in general. He was dethroned from the government of the world by his son Jupiter. His temple in Rome was used as the state treasury.

Satyri (*sat'er-ī*), or **Satyrs** (*sat'erz*).—A kind of wood-deities, resembling apes, with two goats-feet, and very lascivious. The older Satyrs were generally called Sileni (*sī-lē'nī*), and the younger ones Satyrisci. They were described as fond of wine, sleep, and music.

Scamander (*ska-man'der*).—A celebrated river near Troy.

Scamandrius (*ska-man'dri-us*), or **Scamander.**—Son of Hector and Andromache (*an-drom'a-kē*), whom the Trojans called Astyanax (*q.v.*).

Sciron (*sī'ron*).—A famous robber of Attica, slain by Theseus. He compelled those he robbed to wash his feet on the Scironian rock (which was named after him), and at the completion of the process kicked them over the rock into the sea. At the base of the rock was a tortoise, which devoured them.

Scylla (*sill'a*), and **Charybdis** (*ka-rib'dis*).—The names of two rocks, opposite to one another, between Italy and Sicily. In the one nearest to Italy was a cave in which dwelt Scylla, who was a terrible creature (female) with six long necks and heads, each of which contained three rows of sharp teeth, twelve feet, and barking like a dog. On the opposite rock, Charybdis, dwelt a being of the same name under an immense fig tree. Thrice a day she swallowed the waters of the sea and thrice threw them up again. Between these rocks, Scylla and Charybdis, the sea was very narrow and very dangerous. Hence mariners had to exercise great vigilance lest while avoiding Scylla they did not fall on Charybdis. This last expression is often used in speaking of cases where a middle course has to be carefully steered between two threatening difficulties.

Scyros (*sī'ros*).—An island in the Ægean Sea, near Eubœa. Here Achilles—at the court of King Lycomedes—was concealed, dressed as a woman, by his mother Thetis, in order to prevent his going to the Trojan war.

Sedrat.—The lotus tree which stands on the right hand side of the invisible throne of Allah. Its branches extend wider than the distance between heaven and earth. Its leaves resemble the ears of an elephant. Each seed of its fruit incloses an houri; and two rivers issue from its roots. Numberless birds sing among its branches, and numberless angels rest beneath its shade.

SCENES FROM THE STORY OF PSYCHE AND VENUS

PSYCHE'S PARENTS CONSULT THE ORACLE

A ZEPHYR BORE PSYCHE FROM THE EARTH

BURNING OIL FELL ON CUPID'S SHOULDER

A FISHERMAN SHELTERS PSYCHE

SHE OPENED THE BOX

PSYCHE'S SISTERS ASKED WHAT SORT OF A PERSON HER HUSBAND WAS

VENUS AND PSYCHE BECOME RECONCILED

"DRINK THIS, PSYCHE, AND BE IMMORTAL"

THE MARRIAGE OF CUPID AND PSYCHE

This symbolical picture represents the conscious union of the Soul of Man, figured as a young girl (Psyche), with the divine Spirit of Love (Cupid). Their starry or celestial environment signifies the emergence of the soul from matter into a permanent, uninterrupted or eternal life. The beautiful Greek story as a whole is simply an allegory describing the fall of the soul of man into earthly conditions; the labors and pains there undergone in order that, refined and redeemed, it may once more be raised into the heavenly world.

Semele (*sem'el-ē*).—Daughter of Cadmus and Harmonia, and mother, by Jupiter, of Bacchus. Juno, actuated by jealousy, persuaded her to ask Jupiter to appear before her in his terrible majesty as king of heaven. Having promised to grant whatever she desired, Jupiter did so; but warned her of the danger she would incur. The result was that she was consumed by the lightning; but Jupiter saved her child Bacchus.

Serapis (*se-rā'pis*).—An Egyptian divinity (male), whose worship was introduced into Rome, together with that of Isis, toward the end of the republic.

Seven Sages.—Same as *Seven Wise Men of Greece* (*q.v.*).

Seven Wise Men of Greece.—The title applied to seven Greeks of the sixth century B. C., who were distinguished for their practical wisdom and their terse maxims or principles of life. Their names are as follows: Bias, Chilo, Cleobulus, Periander (in place of whom some give Epimenides), Pittacus, Solon and Thales. They were the authors of the following famous mottoes, inscribed in later times in the temple of Apollo at Delphi: "Most men are bad," *Bias;* "Consider the end," *Chilo;* "Avoid excess," *Cleobulus;* "Nothing is impossible to industry," *Periander;* "Know thy opportunity," *Pittacus;* "Know thyself," *Solon;* "Suretyship is the precursor of ruin," *Thales.*

Seven Wonders of the World.—A name applied to seven very remarkable objects of the ancient world. They are usually given as follows:

(i) The Pyramids of Egypt.

(ii) The Pharos (*fā'ros*) of Alexandria, which was a lofty lighthouse built by Ptolemy II. on the island of the same name, just opposite to Alexandria and united to it by a mole.

(iii) The walls and hanging gardens of Babylon. The walls are described under "Ninus." The hanging gardens of Nebuchadnezzar were laid out upon terraces, which were raised one above another on arches.

(iv) The Temple of Diana at Ephesus.

(v) The colossal statue of the Olympian Jupiter by Phidias. It was made of ivory and gold, and the god was represented as seated on a throne of cedar wood, adorned with gold, ivory, ebony and precious stones.

(vi) The mausoleum of Artemisia.

(vii) The Colossus of Rhodes.

Sibyllæ (*si-bil'lē*), or **Sibyls.**—Prophetesses, supposed to be ten in number. The most famous of them is the Cumæan, who was consulted by Æneas before he descended into the lower world and gave him the sop to throw to Cerberus, which, when he had devoured it, threw him into a deep sleep and so enabled Æneas to slip by.

Sichæus (*si-kē'us*).—Dido's uncle and husband; often called Acerbas. He was murdered by Pygmalion, Dido's brother.

Silenus (*si-lē'nus*).—A name specially applied to a satyr (*q.v.*) who brought up and instructed Bacchus and was his constant companion. He is described as a bald-headed, jovial old man, generally intoxicated, and hence unable to trust his own legs to carry him safely. He generally rode on an ass. He possessed prophetic powers, which he could be made to exercise by surrounding him with chains of flowers while he was drunk and asleep.

Silvanus (*sil-vā'nus*).—A Latin deity presiding over woods and forests.

Sinon (*sin'on*).—Son of Æsimus, who allowed the Trojans to take him prisoner, and then persuaded them to take the famous wooden horse into their city. See "Troy."

Sirenes (*sī-rē'nēz*), or **Sirens** (*sī'renz*).—Sea nymphs, three in number, who had the power of enticing mariners to their destruction on dangerous rocks by their sweet music. In order to get his ship away in safety from them, Ulysses stuffed the ears of his companions with wax and then tied himself to the mast of the vessel, and did not release himself till he could no longer hear their charming voices. They dwelt on an island near the southwest coast of Italy.

Sisyphus (*sis'i-fus*).—Son of Æolus and king of Corinth; notorious for his avarice and deceit. His punishment in the lower world was to roll to the top of a hill a huge marble block, which no sooner reached the top than it rolled down again: hence a never-ending punishment.

Siva.—The third of the Hindu triad of divinities, who, among a thousand names, bears also that of Mahadeva. The greatest confusion exists as to his attributes; now he is said to be the destroyer, and now the creative principle.

Somnus (*som'nus*).—The god of sleep; was a son of Night and a brother of Death.

Soracte (*sō-rak'tē*).—A high mountain, near the Tiber, in Etruria, on the summit of which was a temple of Apollo.

Specter of the Brocken.—Among German myths, a singular colossal apparition seen in the clouds, at certain times of the day, by those who ascend the Brocken, or Blocksberg, the highest peak of the Hartz mountains.

Sphinx (*sfingks*).—A she-monster, who proposed a riddle to the Thebans, and murdered all who failed to guess it (see "Œdipus"). In works of art she is represented with a woman's bust on the body of a lioness. The word Sphinx (Gr.) means *the Throttler*, from her manner of killing her victims.

Stentor (*sten'tor*).—A Grecian herald in the Trojan war. His voice was as loud as that of fifty ordinary men together: hence our word *stentorian*.

Stheno.—See "Gorgons."

Stymphalus (*stim-fā'lus*).—A town in Arcadia; the haunt of the terrible birds slain by Hercules. See "Hercules (vi)."

Styx (*stiks*)—*i. e.*, "the hateful, horrible" (Gr.).—The principal river of the lower world, around which it flows seven times. Charon (*q.v.*) ferried the souls of the departed across it. By the Styx the gods swore their most sacred oaths.

Surya.—The sun-god, according to the Hindu *Veda*, whose car is drawn by seven green horses, the charioteer being Dawn.

Sybaris (*sib'ar-is*).—A Greek town in Lucania, notorious for the luxury of its inhabitants: hence our word *Sybarite*.

Syphax (*sif'ax*).—King of one of the tribes of the Numidians. See "Sophonisba."

Syrinx (*si'rinks*).—A nymph, who, being pursued by Pan, was metamorphosed into a reed, of which Pan then made his shepherd's pipe, usually called Pan's pipe.

T

Tantalus (*tan'ta-lus*).—Son of Jupiter and the nymph Pluto; father of Pelops and Niobe. Having divulged some of his father's secrets, he received a terrible punishment in the lower world. He was made to stand up to his chin in water, being at the same time afflicted with a raging thirst, and over his head hung branches of tempting fruit, yet when he attempted to drink the waters receded from him, and when he would pluck the fruit the branches immediately sprang out of his reach. Moreover, a huge rock was suspended above his head, threatening every moment to crush him. (Hence our word *tantalize*, meaning to torment by holding out hopes or prospects which cannot be realized.)

Tarpeia (*tar-pē'ya*).—Daughter of the governor of the Roman citadel; was tempted by the gold bracelets of the Sabines, who, in the time of Romulus, were besieging the fortress, to treacherously open one of the gates. As they rushed in they threw their shields upon her and crushed her to death. The Tarpeian Rock (*tar-pē'yan*), from which criminals were hurled headlong, was named after her.

Tartarus (*tar'ta-rus*).—The place of punishment of the wicked in the lower world, as opposed to the Elysian Fields, the abode of the blessed. Sometimes it means the lower world generally.

Taygete (*tā-ij'et-ē*).—Daughter of Atlas and Pleione, one of the Pleiones.

Tecmessa (*tek-mes'sa*).—Daughter of Teleutas, king of Phrygia, and mistress of Ajax the Great.

Telamon (*tel'a-mon*).—Son of Æacus and brother of Peleus. He was king of Salamis and father of Ajax the Great (or Telamonius) and of Teucer, the celebrated archer. He was one of the Argonauts, and took part in the Calydonian boar hunt.

Telegonus (*te-leg'on-us*).—Son of Ulysses and Circe. He killed his father without knowing it. See "Ulysses."

Telemachus (*tē-lem'ak-us*).—Son of Ulysses (*q.v.*) and Penelope.

Telephus (*tē'le-fus*).—Son of Hercules and king of Mysia. He married Laodice, daughter of Priam, king of Troy. He was wounded by the spear of Achilles, but was afterward cured by its rust.

Tenedos (*ten'e-dos*).—A small island in the Ægean Sea, off the coast of Troas. Hither the Greeks brought their fleet when they pretended to sail away from Troy (*q.v.*).

Tereus (*tē'rūs*).—Son of Mars, king of Thrace and husband of Procne, by whom he became the father of Itys. He hid Procne and married Philomela (*q.v.*). Procne killed her son Itys and served him up in a dish to Tereus. She then fled with her sister Philomela. Procne was afterwards changed into a swallow, Philomela into a nightingale, and Tereus into a hawk.

Terpsichore.—See "Musæ."

Tethys (*tē'this*).—Wife of Oceanus and mother of the sea-nymphs and sea-gods.

Teucer (*tū'ser*).—(i) Brother of Ajax the Great, and the most skillful archer among the Greeks before Troy. (ii) The first king of Troy: whence the Trojans are sometimes called Teucri.

Thalia.—See "Musæ."

Themis (*them'is*).—The goddess of justice and of prophecy. She is generally represented holding a cornucopia and a pair of scales.

Thersites (*ther-sī'tēz*).—A Greek before Troy, notorious for his ugliness and scurrility. He was killed by Achilles.

Theseus (*thē'sūs*).—The great legendary hero of Attica; was the son of Ægeus, king of Athens, and of Æthra. He went of his own accord as part of the yearly tribute of Athens to the Minotaur (*q.v.*). Ariadne, the daughter of Minos, however, fell in love with the hero, and gave him a sword wherewith he slew the monster, and a clue of threads by means of which he found his way out of the labyrinth. Theseus then sailed away in company with Ariadne, but he abandoned her (see "Ariadne") in the island of Naxos. When approaching Attica, he forgot to hoist the white sail, as a token of success, and so caused the death of his father (see "Ægeus"). Theseus thus became king of Athens. His life was full of adventure. He was an Argonaut, and took part in the Calydonian boar hunt. His friendship with Pirithous is proverbial. He even accompanied Pirithous into the lower world with the object of carrying off Proserpine (see "Pirithous"). On his return from the lower world he found himself unable to re-establish himself as king of Athens, and retired to the island of Scyros, where he was killed by Lycomedes, the king, who treacherously thrust him down a rock.

Thetis (*thet'is*).—A sea-nymph; daughter of Nereus and Doris, wife of Peleus and mother of Achilles. At her wedding with Peleus occurred the celebrated incident of the Golden Apple (see "Paris").

Thisbe (*this'be*).—A beautiful maiden of Babylon, beloved by Pyramus (*pi'ra-mus*).—Their parents being averse to their union, they used to converse secretly through a hole in the wall, as they lived in adjoining houses. Once they agreed to meet at the tomb of Ninus. Thisbe arrived first, but perceiving a lioness devouring an ox, she took flight. While running she lost her garment, which the lioness seized and soiled with blood. Meanwhile Pyramus came on the scene, and finding her garment soiled with blood, he imagined that she had been slain, and killed himself. Thisbe returned later, and finding the dead body of her lover killed herself also.

Thor.—In Scandinavian mythology the eldest son of Odin and Frigga; strongest and bravest of the gods. He launched the thunder, presided over the air and

the seasons, and protected man from lightning and evil spirits. His wife was Sif ("love"); his chariot was drawn by two he-goats; his mace or hammer was called Mjolner; his belt was Megin-giord, and whenever he put it on his strength was doubled; his palace, Thrudvangr, contained five hundred and forty halls; Thursday is Thor's day. This word means "refuge from terror."

Thyone (*thī-ō'nē*).—The name given to Semele when she was brought from the lower world by her son Bacchus and placed among the immortals.

Tiresias (*tī-res'i-as*).—A celebrated blind soothsayer of Thebes. He was blind from his seventh year; but lived to a great age. He was one of the most famous soothsayers in all antiquity.

Tiryns (*tī'rins*).—A town in Argolis; one of the most ancient in all Greece, where Hercules was brought up. Remains of the city are still to be seen.

Tisiphone.—See "Furiæ."

Titanes (*tī-tā'nēz*).—The Titans; the six sons and six daughters of Uranus (Heaven) and Ge (Earth), who contended with Jupiter for the sovereignty of heaven, but were overcome by him and precipitated into Tartarus.

Tithonus (*ti-thō'nus*).—Son of Laomedon and brother of Priam. He was beloved by the goddess Aurora, who endowed him with immortality, but not with eternal youth. Consequently, with the gradual decay of nature, he became at length a decrepit old man, whose immortality with ever-weakening physical vigor became a terrible burden to him. Aurora eventually changed him into a grasshopper.

Trimurti.—The name of the Hindu triad of deities; or Brahma, Vishnu, and Siva united in one god-head, and spoken of as an inseparable unity.

Triptolemus (*trip-tol'em-us*).—Son of Celeus, king of Eleusis. He was the favorite of Ceres, and the inventor of the plow and agriculture: hence introduced civilization, which follows the latter. He introduced the worship of Ceres.

Triton (*trī'ton*).—A sea-god; son of Neptune, who blows through a shell to calm the sea. He is represented with a man's head and body, the lower part being that of a fish.

Troas (*trō'as*).—The region about Troy (or Ilium), forming one of the five parts into which Mysia, a district occupying the northwest corner of Asia Minor, was divided. Troas is frequently called *The Troad.*

Troilus (*trō'il-us*).—Son of Priam and Hecuba; slain by Achilles.

Troja (*trō'ja*), or **Troy,** called by the Greeks **Ilium** (*i'li-um*).—A city of Asia Minor, situated in the Troad, famous for its ten years' siege by the Greeks. The name Troy was derived from king Tros (*trōs*), who gave his name originally to the district (Troas) and the people; Ilium from Ilus, son of Tros, who founded the city—which, however, was also called, after his father, Troy. The Trojan war forms the subject of Homer's immortal poem, the *Iliad.* The history of this celebrated war may be briefly told as follows: The war arose from the abduction of Helen, wife of Menelaus, king of Sparta, and the most beautiful woman of her time, by Paris, son of Priam, king of Troy. The cause of her abduction is given under "Paris" and "Helen." All the chiefs of Greece, who had been former suitors of Helen, joined Menelaus in an expedition to Troy to bring her back. They accordingly massed all their forces and sailed for the coast of Troas. Even the gods took an active part in the contest: Juno and Minerva, owing to the judgment of Paris, were hostile to the Trojans, and accordingly sided with the Greeks; while Venus, to whom Paris had awarded the golden apple, took the side of the Trojans. The innumerable incidents of the siege itself must be passed over; only the remarkable way in which, after a ten years' siege, the city was finally taken, must be told. The city contained an ancient statue of Pallas (*i. e.* Minerva), called the Palladium, (*q.v.*) on the preservation of which the safety of the city was supposed to depend. Accordingly the Greeks make a night attack on Troy, and Ulysses and Diomedes succeeded in carrying off this Palladium. A little later the Greeks returned to their ships and sailed away, pretending that they had relinquished the siege. On the plain before the city, however, they left behind them the celebrated *wooden horse,* the invention of Ulysses, which was hollowed out in the interior sufficiently to admit of the presence of its wily inventor and a few other heroes within it. Meanwhile Sinon, a relation of Ulysses, had allowed himself to be taken prisoner by the Trojans, and then persuaded them to draw this wooden horse, which he pretended was an atonement for the Palladium, into the city. They foolishly believed him and dragged the horse into the city, and in the dead of night Sinon let the Greeks out of the horse, and they at once set fire to the city. Meanwhile the main body of the Greeks, who had gone no farther than the island of Tenedos, returned and rushed through the gates of the city, opened by their friends within, and in this way the city was taken. The date most generally accepted for the capture of Troy is B. C. 1184.

Trolls.—Dwarfs of Northern mythology, living in hills or mounds; they are represented as stumpy, misshapen, and humpbacked, inclined to thieving, and fond of carrying off children or substituting one of their own offspring for that of a human mother. They are called hill-people, and are especially averse to noise, from a recollection of the time when Thor used to fling his hammer after them.

Tydeus (*tī'dūs*).—Son of Œneus, king of Calydon, and father of Diomedes, who was one of the principal Greek heroes at the Trojan war. Hence Diomedes is often called by his patronymic Tydides (*ti-dī'dēz*).

Tyndareus (*tin'dar-ūs*).—King of Sparta and husband of Leda. He invited Menelaus to come to Sparta, and handed over the kingdom to him.

Typhoeus (*ti-fō'ūs*), or **Typhon** (*tī'fon*).—A giant who wished to acquire the sovereign power over gods and men, but was overcome with a thunderbolt from Jupiter and buried under Mount Ætna.

Tyr.—In Norse mythology, a warrior deity, and the protector of champions and brave men; he was also noted for his sagacity. When the gods wished to bind the wolf Fenrir, Tyr put his hand into the demon's mouth as a pledge that the bonds should be removed again. But Fenrir found that the gods had no intention of keeping their word, and revenged himself in some degree by biting the hand off. Tyr was the son of Odin and brother of Thor.

U

Ulin.—An enchantress, who had no power over those who remained faithful to Allah and their duty; but if any fell into error or sin, she had full power to do as she liked. Thus, when Misnar (sultan of India) mistrusted the protection of Allah, she transformed him into a toad. When the Vizier Horam believed a false report, obviously untrue, she transformed him also into a toad. And when the Princess Hemjunah, to avoid a marriage projected by her father, ran away with a stranger, her indiscretion placed her in the power of the enchantress, who transformed her likewise into a toad. Ulin was ultimately killed by Misnar, sultan of Delhi, who felled her to the ground with a blow.

Ulysses (*ū-lis'ēz*), or **Ulixes** (*u-lix'ēz*); called **Odysseus** (*od-is'sūs*) by the Greeks.—A king of Ithaca, famed among the Grecian heroes of the Trojan war for his craft and eloquence; the son of Laertes, husband of Penelope, and father of Telemachus and Telegonus (by Circe). In order to escape from going with the other Greek heroes against Troy, he feigned madness, ploughing the sea-shore with a horse and bull yoked together and sowing salt. The imposture, however, was laid bare by Palamedes (*q.v.*), who placed Telemachus, the infant son of Ulysses, in the furrow, when the latter at once turned aside the plough; but the wily Ulysses had his revenge on Palamedes. Ulysses, in his turn, sought out and obtained the indispensable assistance of Achilles (*q.v.*). At the siege of Troy his cunning and valor were of the greatest service to the Greeks. In company with Diomedes he slew the horses of Rhesus, and also carried off the Palladium (*q.v.*). Perhaps the crowning effort of his ingenuity was the invention of the famous wooden horse, by means of which the city of Troy (*q.v.*) was ultimately taken by the Greeks. After the taking of Troy Ulysses set out for Ithaca, which, however, he did not reach for twenty years. During this time he passed through the adventures which form the subject of Homer's glorious poem, the *Odyssey,* which takes its name from Odysseus, the Greek name for Ulysses. He thus visited Circe (*q.v.*), Polyphemus (*q.v.*), the Lotophagi, and other persons and places. In order to get safely past the island of the Sirens, he, with his usual sagacity, devised special means, which proved entirely successful (see "Sirens"). He lost six of his companions while sailing between Scylla (*q.v.*) and Charybdis. He then suffered shipwreck, he alone escaping by means of the mast and planks. In ten days he was drifted on to the island of Ogygia, inhabited by Calypso (*q.v.*), with whom he stayed for eight years. He then constructed a raft, and made his way to the island of Scheria (*q.v.*), whence he obtained a ship that carried him to Ithaca. He did not, however, make himself known at once to his wife and son. In order to see how the land lay, he disguised himself

as a beggar, but was kindly received by the old swineherd. Meanwhile his son Telemachus, now grown up to manhood, returned from a journey to Pylos and Sparta, undertaken with a view to gleaning what information he could as to the probable whereabouts of his father. Ulysses then made himself known to Telemachus, and the two resolved on a plan of revenge on the numerous unfortunate suitors for the hand of the virtuous and constant Penelope (*q.v.*). With great difficulty she was induced (being, as yet, unaware of the safe arrival of her husband) to promise her hand to that suitor who could shoot with the bow of Ulysses. Not one of them, however, was able to draw this bow, whereupon Ulysses himself took it up and slew them all. He then made himself known to Penelope, and went to see his father Laertes, bowed down with grief and years. Now Circe, who had had a son, Telegonus, by Ulysses, sent him in search of his father. Telegonus encountered a storm which cast his ship on the coast of Ithaca, and being pressed by hunger, he began to plunder the fields. Ulysses and Telemachus hearing of this, went out against the spoliator; but Telegonus, not knowing Ulysses, ran him through the body with a spear given to him by his mother. Thus the famous hero died at the hands of his own son. Telegonus afterwards married Penelope, and became by her the father of Italus.

Urania (*ū-rā'ni-a*).—The muse of astronomy. See "Musæ."

Uranus (*ū'ra-nus*), or **Heaven.**—Husband of Gæa (Earth), and father of Oceanus, Hyperion, Rhea, Themis, Cronos, and other children. At the instigation of Gæa he was dethroned by Cronos.

Utgard-Loki.—The chief of the giants, in Norse mythology.

V

Varuna, or **Vrauna.**—In Hindu mythology, the deity who presides over the waters of the ocean, corresponding with *Neptune* of classic mythology.

Valhalla.—In Scandinavian mythology the palace of immortality wherein are received the souls of heroes slain in battle.

Valkyrs.—The battle-maidens of Scandinavian mythology. They were mounted on swift horses and held drawn swords. They rushed into battle and selected those destined to death and conducted them to Valhalla. The number of Valkyrs differs greatly according to the various mythologists and ranges from three to sixteen, the greater part of them, however, naming only nine.

Venus (*vē'nus*); called by the Greeks **Aphrodite** (*af-ro-dī'tē*)—*i. e.* "sea-foam."—The goddess of love and beauty. She was supposed to have sprung from the foam of the sea: hence her Greek name. She was the wife of Vulcan, but was very unfaithful to him. She loved the gods Mars, Bacchus, Neptune and Mercury, and the mortals Adonis and Anchises. She was considered by Paris (*q.v.*) the most beautiful of the goddesses and had awarded to her the celebrated Golden Apple. Anyone who wore her magic girdle immediately became beautiful and the object of love and desire. She is generally accompanied by her son Cupid. The month of April, as the commencement of spring, was considered peculiarly sacred to the goddess of love. The myrtle, rose, apple and poppy, and the sparrow, dove, swan and swallow, were all sacred to her. She was probably originally identical with Astarte, a Syrian goddess, called by the Hebrews Ashtoreth. As might have been anticipated, the representation of the Queen of Beauty on canvas and in marble has resulted in some of the finest works of the most celebrated painters and sculptors of antiquity. Among the former, Apelles' masterpiece of Venus rising from the sea deserves special mention; and among the latter the "Cnidian Venus" (so called because it stood in her temple at Cnidus), by Praxiteles, is unquestionably the most famous. Phryne (*q.v.*) sat as model for both of these noble works of art. The fame of the "Cnidian Venus" was so great that travelers from all parts of the civilized world resorted to Cnidus in order to see it. In fact, Pliny and others declared it to be the finest statue in the world. The "Venus of Milo" is, however, the noblest extant representation of Venus. It was found, in 1820, in the island of Melos, the modern Milo (hence the epithet), which is one of the group of islands named the Cyclades, in the Ægean Sea. It now forms one of the treasures of the Louvre, Paris.

Vertumnus (*ver-tum'nus*).—The god of the changing year—that is, of the seasons and their productions. His festival was celebrated by the whole Roman people on the 23rd of August.

Vesta (*ves'ta*); called by the Greeks **Hestia** (*hes'ti-a*)—*i. e.* "the hearth."—One of the twelve great Roman deities, the goddess and guardian of the hearth and home. She was the daughter of Saturn and Rhea. In her temple in the Forum at Rome stood no statue, the goddess being represented by the eternal fire burning on her altar as her abiding symbol. This fire was kept up and attended to by a number of virgin priestesses, called Vestals, who were chaste and pure like the goddess herself. On March 1 in every year the sacred fire was renewed, and on June 15 her temple was cleaned and purified.

Vidar.—The Scandinavian god of wisdom, noted for his thick shoes, and not infrequently called "The god with the thick shoes."

Vishnu.—In Hindu mythology one of the great deities of the Hindu triad, ranking as the *Preserver*, after Brahma, the *Creator*, and before Siva, the *Destroyer*. It is believed that he has appeared on earth nine times, his tenth *avatar*, or incarnation, having yet to come.

Volumnia (*vol-um'ni-a*).—Wife of Coriolanus (*q.v.*).

Vulcanus (*vul-kā'nus*), or **Vulcan;** called **Hephæstus** (*hē-fēs'tus*) by the Greeks. The god of fire. He was the son of Jupiter and Juno, and was lame from his birth. Besides being the god of fire, he was master of the arts which need the aid of fire, especially of working in metal. He made all the palaces of the gods on Olympus, the armor of Achilles, the fatal necklace of Harmonia, the fire-breathing and brazen-hoofed bulls of Æëtes (see "Argonautæ"), etc. The Cyclops were his workmen, and his workshops were situated under Mount Ætna in Sicily. Vulcan's wife was Venus. His favorite abode on the earth was the island of Lemnos. His great festival was celebrated on the 23rd of August.

W

White Lady.—In German folk-lore, the ancient Teutonic goddess Holda or Berchta, who was the receiver of the souls of maidens and children, and who still exists as the White Lady, not infrequently, in German legends, transforming herself, or those whom she decoys into her home, into a white mouse.

Wild Huntsman, The.—A spectral hunter in folk-lore, especially in German folk-lore; the subject of a ballad by Bürger.

Woden (*wō'den*), or **Wotan.**—The Anglo-Saxon form of the Scandinavian god Odin; Wednesday is called after him.

Y

Yama.—In the *Rigveda*, the name of the god who rules in heaven over the blessed—the Manes, Fathers, or Pitris—and is therefore called king.

Yggdrasil.—In Scandinavian mythology the great ash tree which binds together heaven, earth, and hell. Its branches extend over the whole earth, its top reaches heaven, and its roots hell. The three nornas, or fates, sit under the tree, spinning the events of man's life.

Z

Zem.—The sacred well of Mecca. According to Arab tradition, this is the very well that was shown to Hagar when with Ishmael in the desert. It is supposed to be in the heart of the city of Mecca.

Zephyrus (*zef'i-rus*).—The west wind, or properly, the northwest.

Zeus (*zūs*).—See "Jupiter."

Zohak.—The giant of Persian mythology who keeps the "mouth of hell." He was the fifth of the Pischdadian dynasty, and was a lineal descendant of Shedâd, king of Ad. He murdered his predecessor, and invented both flaying men alive and killing them by crucifixion. The devil kissed him on the shoulders, and immediately two serpents grew out of his back and fed constantly upon him. He was dethroned by the famous blacksmith of Ispahan, and appointed by the devil to keep hell-gate.

Zohara.—An oriental queen of love, and mother of mischief. When Harût and Marût were selected by the host of heaven to be judges on earth, they judged righteous judgment till Zohara, in the shape of a lovely woman, appeared before them with her complaint. They then both fell in love with her and tried to corrupt her, but she flew from them to heaven; and the two angel-judges were forever shut out.

Zulzul.—According to Chinese mythology the sage whose life was saved in the form of a rat by Gedy, the youngest of the four sons of Corcud. Zulzul gave him, in gratitude, two poniards, by the help of which he could climb the highest tree or most inaccessible castle.

EXPLANATORY CHART OF GREEK AND ROMAN MYTHOLOGY: SHOW

The relationship of these mythical personages are quite unlike those of mortals and are full of incon-
this chart is as consistent with their

CHAOS
Produced EREBUS, god of *darkness*, NOX, goddess of *night*, and TERRA, *Earth*.

TERRA or TITÆA produced CŒLUS or URANUS, *Heaven*

CŒLUS or URANUS, i. e. *Heaven*, and TERRA OR TITÆA, i. e. *Earth*. } had

TITAN
Oldest of the twelve Titans.

THE CYCLOPS
Giants, at first three in number:
Arges,
Brontes,
Steropes.

BRIAREUS
A famous giant called by men Ægæon, and by the gods Braireus.

TETHYS
Wife of *Oceanus;* for offspring, see **Oceanus.**

THEA
Wife of *Hyperion;* the mother of rivers, and of about three thousand daughters, called *Ocean'i-des.*

SATURN
or **Cronos,**
god of Time, had by { *Rhea* same as *Ops*, same as *Cybele.* } .....

MNEMOSYNE
Mother of the nine *Muses.*

THEMIS
Mother of Astræa, goddess of Justice.

CYBELE
OPS or RHEA, wife of *Saturn;* the goddess of *all things;* styled *Magna Mater* or *Great Mother, Bona Mater* or *Good Mother;* for off-spring, see **Saturn.**

OCEANUS
The god of water, to whom the ancients recommended themselves when going on a voyage, had by Tethys.

JUNO, wife and sister of Jupiter, queen of the gods, and of Heaven and Earth.

JUPITER
or **Zeus,** the most powerful of all the gods; king of gods and men, had....

VESTA, the goddess of *fire,*

CERES, the goddess or *corn*

LATONA, celebrated for her

NEPTUNE, the god of the

PLUTO, the god of the

AMPHITRITE had by....
CYLMENE had by.....
PHORCYS had by.....
ACHELOUS had by.....
The Harpies, viz., Aello,

HYPERION, god of the Sun, had by *Thea,* AURORA, the goddess of the *morning;*

JAPETUS, father of mankind, had by *Clymene,* ATLAS, also Prometheus, Epi-

EREBUS and NOX } had { Light, or Day, Somnus, Mors, and Charon, the Ferryman } *Nox* or *Night, Mors* or *Death, Somus* or *Sleep,* and *Morpheus* (the minister of Som- *Momus,* god of laughter and satire, son of somnus and Nox.

Ancient Roman Sun-god — **Janus,** the god of the *year,* presided over the gates of heaven, and over peace and

ING THE ORIGIN, RELATIONSHIP AND DESCENT OF CHIEF MYTHS

sistencies. To reconcile all the contradictions of the poets and mythologists is impossible. Perhaps fabulous tales as can well be made.

By Them'is.
Astræa, the goddess of *justice;* **Nemesis,** of *vengeance.*
By Juno.
Mars, the god of *war;* by *Venus,* Anteros, Harmonia; the goddess of *youth;* once cupbearer to Jupiter.
Hebe, by her husband *Hercules,* Alexiares and Anicetus.
Typhon, by the monster *Echidna,* Chimæra and Sphinx.
Vulcan, the god of *fire* and of *blacksmiths,* and husband of Venus; by his wife *Venus,* Cupid; by *Medusa,* Cacus, by *Juno,* Cœculus.
By Lato'na.
Apollo, the god of *poetry, music, eloquence, medicine, the fine arts, augury,* and *archery.*
Diana, the goddess of *hunting,* the patroness of chastity, presided also over childbirth.
By Ma'ia.
Mercury, the *messenger* of the gods, the god of *eloquence* and *commerce,* the patron of *travellers, thieves,* and *knaves,* and the conductor of the souls of the dead to the infernal regions. By *Penelope,* Pan. By the Greeks he was called *Hermes.*

By Mnemos'y-ne.
The Nine Muses.
Cli'o presided over History.
Calli'o-pe presided over eloquence and epic poetry.
Er'ato presided over lyric and amorous poetry.
Thali'a presided over pastoral and comic poetry and festivals.
Melpom'e-ne presided over tragedy.
Terpsich'o-re presided over dancing.
Euter'pe presided over music.
Polyhym'nia presided over singing and rhetoric.
Ura'nia presided over astronomy.
} See Dictionary of Mythology.
By Euryn'o-me.
Graces.
Agla'ia
Thali'a
Euphros'y-ne
} Three beautiful virgins, attendants on Venus; presided over kindness and good offices, and were supposed to give to beauty its charms; represented dancing in a circle with their hands joined.
By Sem'e-le.
Bacchus, the god of *wine;* by his wife *Ariadne,* Thoas, Œnopion, Ceranus, Tauropolis, and others.
By Metis.
Minerva, the goddess of *wisdom, war,* and the *liberal and useful arts.*
By Dione.
Venus, said to have been borne in the foam of the sea; the goddess of *love* and *beauty,* and mistress of the graces; wife of *Vulcan;* for offspring, see **Vulcan.**
By Ceres.
Pros'erpine, wife of Pluto, *queen* of hell, presided over death. She was stolen away by Pluto while gathering flowers in Sicily, and became the mother of the Fates and Furies, which see under Dictionary.
By Euro'pa.
Minos, Rhadamanthus, and **Æ'acus,** three inflexible judges of Hades.
By Leda.
Castor and **Pollux.**
By Dan'a-e.
Per'seus.
By Anti'o-pe.
Amphi'on and **Zethus**
} See Dictionary of Mythology.
By Segesta.
Æolus, whose offspring were the various Winds.
By Alcmena.
Hercules, whose descendants were the Heraclidæ.

and patroness of *Vestal Virgins,* who had the care of the sacred fire in the temple of Vesta at Rome, which was kept continually burning.
and *harvest.* The famous *Eleusinian mysteries* were celebrated in honor of Ceres, during the representation of which it was death to speak; as it was also to reveal afterwards what took place.

beauty, and for being greatly beloved by Jupiter and persecuted by Juno.

sea, the father of rivers and fountains, and, next to Jupiter, the most powerful deity; had by *Amphitrite,* TRITON, his father's companion and herald.
infernal regions, of *death* and *funerals;* the dog *Cer'berus,* a frightful mastiff with three heads, and a tail like a serpent, watches at his feet, and three *Har'pies,* winged monsters, hover about him.
Neptune.....TRITON, who had no offspring.
Japetus.....ATLAS, also Menœtius, Prometheus, Epimetheus, and others.
Ceto { The Gorgons, viz., Medusa, Stheno, and Euryale; three sisters whose heads were covered with vipers.
The Graiæ, viz., Pephredo, Enyo, and Dinon.

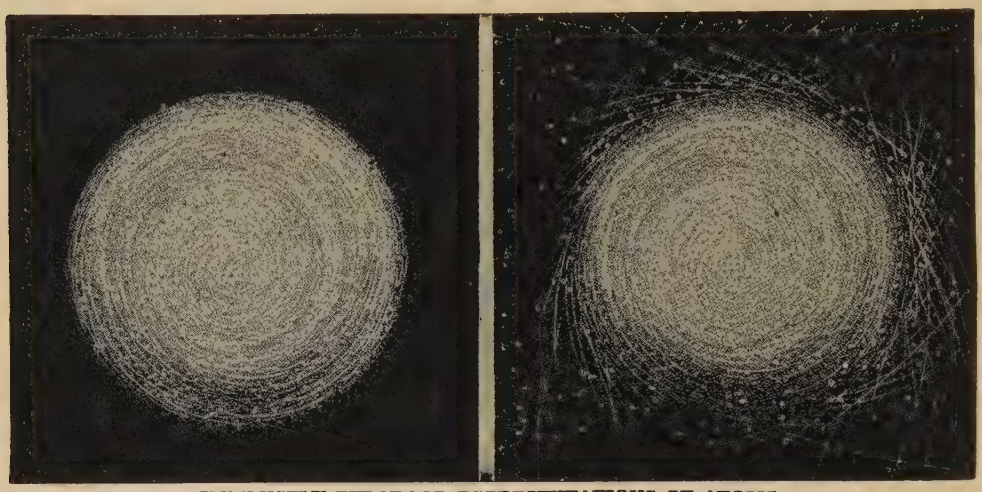
Calliope. The *Sirens* were three sea nymphs, named *Parthen'ope, Lige'ia,* and *Leuco'sia,* having the form of a woman above the waist, and the rest of the body like a flying fish.
Ocypete, and Celæus.
represented riding in a rose-colored chariot drawn by white horses, usually covered with a veil, the morning star appearing overhead. She was called *rosy-fingered,* because she scattered roses; by *Tithon us,* a mortal, she had Memnon and Æmathion.

metheus, Menœtius, and others, called *Japitonides.*

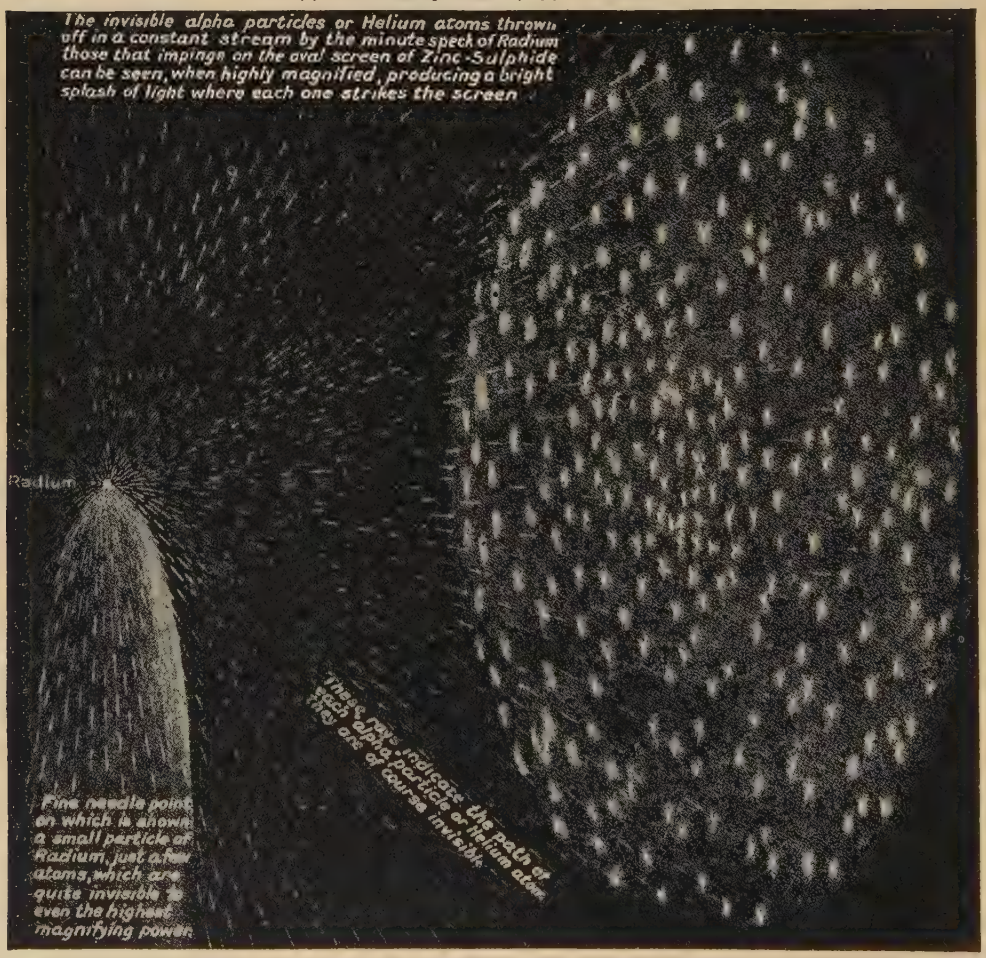
nus, who brought dreams to men) were infernal divinities.

war; represented with two faces. His temple in Rome was open in time of war and shut in time of peace.

SCREENS OF LIGHT CAST BY INVISIBLE ATOMS



IMMENSELY ENLARGED REPRESENTATIONS OF ATOMS
(1) of Ordinary Matter; (2) of Radium



Here is seen an invisible speck of radium throwing out invisible atoms that sparkle into sight on a film. This stream of atoms will pour forth for 2500 years before the radium ceases to exist, thus showing the marvelous energy stored up in the smallest particle. These flying particles fall on the screen or film like hailstones splashing on the surface of water, and the splash is visible, while the radium itself and flying atoms are not. This is the nearest men have yet come to seeing an actual atom.

BOOK OF THE SCIENCES AND INVENTION

HISTORICAL DEVELOPMENT OF THE SCIENCES

OUTLINES OF SCIENCE FOR SCHOOLS

PRACTICAL MATHEMATICS FOR DAILY USE: Business and Industrial Arithmetic, Everyday Applications of Percentage, Weights and Measures, Mensuration and its Applications

COMMERCIAL AND INDUSTRIAL LAW

PHYSICS: ITS PRINCIPLES AND APPLICATIONS

CHEMISTRY: ITS THEORY AND USES

THE CHEMISTRY OF COMMON THINGS

REVISED TABLE OF CHEMICAL ELEMENTS

GREAT INVENTIONS AND SCIENTIFIC DISCOVERIES

RELATION OF THE GOVERNMENT TO SCIENCE

Science in its widest significance is sometimes defined as the correlation of all knowledge. In this sense it would include *philosophy*. In a more restricted and generally accepted sense, the term is applied to the *systematized* divisions of knowledge.

Science and philosophy *resemble* each other in so far as they both have to do with knowledge; but while the latter deals with the whole sum of knowledge and goes back to generalized first principles, the former takes up special branches of it. That is, a science is such in fact when a sufficient number of interrelated facts are so arranged and classified by referring them to the general truths and principles on which they are founded that they constitute a well-certified and more or less complete branch of knowledge.

From the present development of knowledge the separate entities of the universe are five—namely, ether, matter, energy, life, and mind. The first three are inseparable agents in the simplest phenomena that occur in nature. They may ultimately be reduced to two, or, conceivably, to one. It is with these that the various branches of science have to deal—to observe, to experiment, to classify, to define.

Classification of the Sciences.—The sciences may be grouped in two ways. *First*, from what has been said above, they may be divided into:

(a) the *physical* sciences, which have to do with inorganic nature—that is with the laws and properties of matter, energy, and ether;

(b) the *biological* sciences, which consider the laws of life; and

(c) the *psychical* sciences, which deal with the phenomena of mind.

Second.—Another, and probably more practical, division is that of (a) *pure* or *theoretic* sciences, and (b) *applied* or *practical* sciences. The latter consist of those branches which deal with facts, events, or phenomena as explained, accounted for, or produced by means of powers, causes, or laws; the former as the knowledge of these powers, causes, or laws, considered apart or as pure from all applications. To the class of pure or fundamental sciences belong mathematics, physics, chemistry, psychology, and sociology; to the applied or concrete belong geology, mineralogy, botany, zoology, meteorology, geography, ethics, politics, law, jurisprudence, logic, grammar, rhetoric, philology, and political economy; navigation, engineering, and practical mechanics; surgery, medicine, materia medica, etc.

Methods of Science.—The great method of scientific inquiry is *experiment*—the laboratory. Contrasted with experiment is *observation*. But even in astronomy, emphatically an observational science, experiment plays an important part. The dynamical knowledge which Newton developed into the cosmic law of gravitation was founded on experiment. Meteorology, again, has made great strides in these days by appealing to laboratory experiments for elucidation of its phenomena. Likewise in biology, botany, and zoology experiment has led to striking discoveries; while such branches as embryology and bacteriology are as truly experimental as chemistry itself.

In the psychical group of sciences the method of experimenting still awaits development. The complexity of the problems presented, and the manner in which they affect the welfare and happiness of humanity, render social and political experimenting excessively hazardous. Such sciences as those studied by the economist, the ethnologist, the moralist, or the theologian are of necessity essentially observational.

APPLIED ARITHMETIC, WEIGHTS AND MEASUREMENTS

It would be difficult to overestimate the extent to which mathematics enters into the conditions of everyday life. In its elementary stages, as the science of number, it teaches us the relations of magnitude, and enables us to build up a system of calculation and measurement which, applied to the relations observed to exist in nature, gives results of far-reaching importance.

The properties of number are investigated in arithmetic, and methods examined by which those engaged in practical science are able to work out their results to any degree of approximation.

With the help of algebra, we arrive at a system of logarithms by which many of these results may be reached with the minimum of labor.

The measurement of lines and angles, by methods investigated in geometry and trigonometry, enables us to calculate areas, and work out various problems met with in surveying, and is of the first importance in astronomy.

Arithmetic, which deals with the properties of number, forms the basis of all mathematical calculation. (For the *primary* treatment of numbers, see under The Child World.)

COMMON FRACTIONS

A *Fraction* is one or more of the equal parts into which a unit has been divided. A *Common Fraction* is expressed by two numbers; the one written above the line is called the Numerator, the one below, the Denominator: both, called the Terms, denote the value of the fraction.

Thus, in the fraction $\frac{3}{4}$, the denominator 4, denotes that a unit or whole thing has been divided into four equal parts; and the numerator 3, shows that three of those parts are taken or expressed in the fraction.

A *Proper Fraction* is one whose numerator is less than its denominator; as $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$, etc. Its value is always less than 1.

An *Improper Fraction* is one whose numerator is equal to, or greater than its denominator, as $\frac{8}{8}$, $\frac{9}{7}$, $\frac{39}{12}$, etc. Its value is never less than 1.

A *Mixed Number* is a whole number and a fraction; as $3\frac{2}{5}$, $10\frac{1}{2}$, $6\frac{2}{3}$.

The mixed number means that there are whole things taken together with a fraction of another.

A *Complex Fraction* is one in which the numerator or denominator, or both, are fractions.

Thus $\dfrac{3\frac{1}{7}}{2\frac{3}{8}}$, $\dfrac{1}{\frac{5}{6}\times\frac{3}{4}}$, $\dfrac{\frac{15}{17}}{8}$, are complex fractions.

SIMPLE FRACTIONS

A very good method of learning the combinations in small fractions is by the use of paper or cardboard disks.

Cut out a large number of them, and, in order to avoid trouble later on, it might be better to have the disks all of one size—about 4 inches in diameter.

Learning the Fraction ½ With Disks

Explanation:—Take a circular disk and cut it into two equal parts. Then proceed in this manner: What is this part called? What is other part called? How many halves in the whole circle? One-half and one-half are what? One-half taken away from one leaves what? If I take a half two times, what do I get? How many halves in a whole?

Now I will write these—

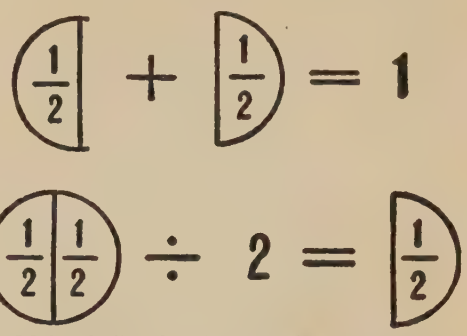
$\frac{1}{2}+\frac{1}{2}=$ $\qquad$ $1+2=$

1 less $\frac{1}{2}=$ $\qquad$ $1-\frac{1}{2}=$

$2\times\frac{1}{2}=$ $\qquad$ 1 divided by $\frac{1}{2}=$

Give me the answers and I will write them.

Drawings showing the "placing" of disks for number combinations can then be made; as,



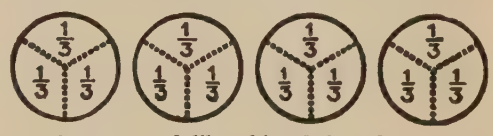
Make similar drawings to tell about halves.

Proceed like this—How many halves in a pie? If a pie cost 10 cents, what will half a pie cost? Who can tell other stories about halves? etc.

Learn fourths along with halves.

Learning the Fraction ⅓ and Others with Disks

Cut several disks into thirds and have children practice on cutting, so that they will be able to make the three parts of each disk equal. Frequently children will find pleasure in "teaching" one another.



Then proceed like this: What do you call each of these parts? Why are they called thirds? How many thirds in a circle? I am going to take a circle and cut it any way, so as to make three parts; do I call these unequal parts thirds? Why not? Let me write one-third on a piece of paper for you. (Write, ⅓.) Draw a circle for me. Instead of cutting it, draw lines where you would cut it to make thirds. Write one-third (⅓) on each third of a circle. I write this (⅓+⅓). Who can tell me what the answer is? Are two-thirds and two-thirds more than one? How much more? I have two-thirds of an apple and give Mary one-third, how much have I left? Who can give other story problems about thirds? Everybody try, etc.

Learn sixths along with thirds. Use disks, dots, marks, sticks, and inches to illustrate.

Remember that no advance should be made until each little part is understood. Then have fifths compared with fourths, thirds, and halves.

Teach tenths along with fifths.

When twelfths are taught, show the relations between twelfths and sixths, fourths, thirds, and halves.

Equal Fractions in Different Forms

Have the children see how fractions may differ in form but still remain the same in value.

Begin with his knowledge of smaller fractions as

$\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, and $\frac{5}{10}$ of an apple.

Let them show by the use of drawings that fractions may have large or small terms but be equal in value.

Write a number of proper fractions, improper fractions, and mixed numbers, and have the children pick out those of each kind; as,

$$\frac{3}{8},\ 27\tfrac{1}{2},\ \frac{5}{11},\ \frac{19}{20},\ \frac{20}{20},\ \frac{18}{16},\ \frac{11}{5},\ 3\tfrac{1}{2},\ 16\tfrac{2}{3}$$

Principles of Fractions

1. A fraction's value is the quotient obtained by dividing the numerator by the denominator.

$$\frac{6}{2}=3 \quad 3 \text{ is the value of } \frac{6}{2}$$

$$\frac{2}{3}=\frac{2}{3} \quad \frac{2}{3} \text{ is the value of } \frac{2}{3}$$

2. Multiplying the denominator of a fraction divides the fraction by that number.

$$\frac{1}{2\times4}=\frac{1}{8} \qquad \frac{3}{7\times3}=\frac{3}{21} \qquad \frac{2}{3\times9}=\frac{2}{27}$$

3. Dividing the denominator of a fraction multiplies the fraction by that number.

$$\frac{3}{8\div4}=\frac{3}{2} \qquad \frac{10}{9\div3}=\frac{10}{3} \qquad \frac{3}{10\div5}=\frac{3}{2}$$

4. Multiplying the numerator of a fraction multiplies the fraction by that number.

$$\frac{2\times2}{3}=\frac{4}{3} \qquad \frac{1\times8}{9}=\frac{8}{9} \qquad \frac{5\times3}{8}=\frac{15}{8}$$

5. Dividing the numerator of a fraction divides the fraction by that number.

$$\frac{4\div2}{7}=\frac{2}{7} \qquad \frac{12\div12}{16}=\frac{1}{16} \qquad \frac{3\div3}{7}=\frac{1}{7}$$

6. Multiplying both numerator and denominator of a fraction by the same number does not change the value of the fraction.

$$\frac{1\times3}{3\times3}=\frac{3}{9}=\frac{1}{3} \qquad \frac{6\times2}{7\times2}=\frac{12}{14}=\frac{6}{7}$$

7. Dividing both numerator and denominator of a fraction by the same number does not change the value of the fraction.

$$\frac{12\div3}{15\div3}=\frac{4}{5}=\frac{12}{15} \qquad \frac{18\div9}{27\div9}=\frac{2}{3}=\frac{18}{27}$$

Reduction of Fractions

is the process of changing their forms without altering their values.

To reduce a fraction to its lowest terms:

Rule.—Divide both terms by their greatest common divisor.

Reduce $^8/_{12}$ to its lowest terms.

Work: $4)\,^8/_{12}\,(\tfrac{2}{3}$ *Ans.* $\tfrac{2}{3}$

Four is the G. C. D. of 8 and 12; hence $^8/_{12}\div4=\tfrac{2}{3}$.

Reduce $^{35}/_{56}$ to its lowest terms.

Work: $7)\,^{35}/_{56}\,(\tfrac{5}{8}$ *Ans.* $\tfrac{5}{8}$

Seven is the G. C. D. of 35 and 56; hence $^{35}/_{56}\div7=\tfrac{5}{8}$.

A fraction whose terms have no common divisor is in its lowest terms, as $^9/_{16}$.

To reduce an improper fraction to a whole or mixed number:

Rule.—Divide the numerator by the denominator; the quotient will be the whole or mixed number.

How many units in $^{30}/_6$?

Work: $30\div6=5$ *Ans.* 5.

There are as many units in 30 sixths as 6 is contained times in 30.

Reduce $^{75}/_4$ to a mixed number.

Work: $75\div4=18+3$ *Ans.* $18\tfrac{3}{4}$.

In 75 fourths there are 18 units, and 3 fourths over, which equals $18\tfrac{3}{4}$.

To reduce a mixed number to an improper fraction:

Rule.—Multiply the whole number by the denominator of the fraction; add the numerator to the product, and write the sum over the denominator.

Reduce $18\tfrac{3}{4}$ to an improper fraction.

Work: $18\times4=72$ $\quad ^{72}/_4+\tfrac{3}{4}=^{75}/_4$ *Ans.* $^{75}/_4$.

In 18 are 72 fourths, plus the 3 fourths, equals 75 fourths.

To reduce two or more fractions to their least common denominator:

Rule.—Find the least common multiple of the given denominators for a common denominator. Then for each new numerator take such a part of this common denominator as the fraction is part of 1.

Reduce $\tfrac{1}{2}$, $\tfrac{2}{3}$ and $\tfrac{3}{4}$ to their L. C. D.

Work:

$$\frac{1}{2}=\frac{6}{12} \qquad \frac{2}{3}=\frac{8}{12} \qquad \frac{3}{4}=\frac{9}{12}$$

Ans. $^6/_{12}$, $^8/_{12}$ and $^9/_{12}$.

The L. C. M. of the denominators 2, 3 and 4 is 12. Hence, 12 is the L. C. D. to which the given fractions can be reduced. Then to change $\tfrac{1}{2}$ to 12ths, say, $\tfrac{1}{2}$ of 12 is 6, and write it over 12; to change $\tfrac{2}{3}$ to 12ths, say $\tfrac{2}{3}$ of 12 is 8, and write it over 12; to change $\tfrac{3}{4}$ to 12ths, say, $\tfrac{3}{4}$ of 12 is 9, and write it over 12.

Fractions must be reduced to a common denominator to be added or subtracted.

Addition of Fractions

If two or more fractions have the same denominator, their sum is obtained by adding the numerators.

Work: $$\frac{1}{7}+\frac{4}{7}+\frac{5}{7}=\frac{1+4+5}{7}=\frac{10}{7}=1\frac{3}{7}$$

If the fractions have different denominators, we must first express them as equivalent fractions with the same denominator.

Example 1: Find the value of

$$\frac{1}{9}+\frac{3}{7}+\frac{5}{21}+\frac{2}{3}$$

The lowest common multiple is 63. The several denominators, when divided into 63, give 7, 9, 3, 21 respectively, for quotients. Therefore, we multiply the numerators and denominators of the fractions by 7, 9, 3, 21, and add the numerators to obtain the required sum. The result must be reduced to a mixed number or to lower terms, if necessary.

Work:

$$\frac{1}{9}+\frac{3}{7}+\frac{5}{21}+\frac{2}{3}$$

$$=\frac{7+27+15+42}{63}$$

$$=^{91}/_{63}=1^{28}/_{63}=1^4/_9 \textit{ Ans.}$$

In adding mixed numbers, first add the whole numbers, then the fractions, finally adding the two results.

Example 2: Add together $3\tfrac{1}{8}+^7/_{24}+7^{11}/_{15}+4^3/_{20}$.

Given expression:

$$=3+7+4+\frac{1}{8}+\frac{7}{24}+\frac{11}{15}+\frac{3}{20}$$

$$=14+\frac{15+35+88+18}{120}$$

$$=14+\frac{156}{120}=14+1\frac{36}{120}=15\frac{3}{10} \textit{ Ans.}$$

Subtraction of Fractions

The principle is the same as in addition. Reduce the fractions, if they have different denominators, to a common denominator, and then take the difference of the numerators.

Example 1: From $^9/_{11}$ subtract $^3/_4$.

$^9/_{11} - ^3/_4 = ^{36}/_{44} - ^{33}/_{44} = ^3/_{44}$

Explanation. — Since the fractions are not similar they must be made similar before subtracting. The least common denominator of the given fractions is 44. $^9/_{11} = ^{36}/_{44}$ and $^3/_4 = ^{33}/_{44}$. $^{36}/_{44} - ^{33}/_{44} = ^3/_{44}$.

When there are mixed numbers or integers subtract the fractions and the integers separately.

Note. — Mixed numbers may be reduced to improper fractions and subtracted according to the rule above.

Example 2. From $4^1/_3$ subtract $2^5/_8$.

$$\begin{array}{r} 4^1/_3 = 4\,^8/_{24} \\ 2^5/_8 = 2^{15}/_{24} \\ \hline 1^{17}/_{24} \end{array}$$

Explanation. — Since the numbers are composed of integers and fractions, the integers and the fractions may be subtracted separately.

The fractions must be first reduced to similar fractions. It is evident that $^{15}/_{24}$ cannot be subtracted from $^8/_{24}$, hence 1 or $^{24}/_{24}$ is taken from 4 and united with the $^8/_{24}$, making $^{32}/_{24}$. $^{15}/_{24}$ from $^{32}/_{24}$ leaves $^{17}/_{24}$, and 2 from 3 (the number left after 1 has been united with the fraction $^8/_{24}$) leaves 1. Hence the remainder is $1^{17}/_{24}$.

Example 3: Simplify $3^2/_9 + 4^5/_7 - 5^{13}/_{21} + ^2/_{35} - 1^{14}/_{15}$.

Given expression:

$$= 3 + 4 - 5 - 1 + \frac{2}{9} + \frac{5}{7} - \frac{13}{21} + \frac{2}{35} - \frac{14}{15}$$

$$= 1 + \frac{70 + 225 - 195 + 18 - 294}{315}$$

$$= 1 + \frac{313 - 489^*}{315}$$

$$= \frac{628 - 489}{315} = \frac{139}{315} \textit{ Ans.}$$

*Obtained by adding all the numerators with + before them, and then all those with — before them.

Multiplication of Fractions

(i) When the multiplier is a whole number. This, as in the case of whole numbers, means that we have to find the sum of a given number of repetitions of the fraction.

Example 1:

$$\frac{7}{9} \times 4 \text{ means } \frac{7}{9} + \frac{7}{9} + \frac{7}{9} + \frac{7}{9}, \textit{ i.e.}, \frac{28}{9}; \text{ or } \frac{7 \times 4}{9}$$

Hence, to multiply a fraction by a whole number, simply multiply the numerator by that number.

Since the multiplier thus becomes a factor of the numerator, we cancel any common factors contained in the multiplier and the denominator; and this may be done before we perform the actual multiplication:

Example 2: Multiply $^{19}/_{46}$ by 69.

$$\frac{19}{46} \times 69 = \frac{19 \times 69}{46} = \frac{19 \times 3}{2} \text{ (cancelling 23)}, = \frac{57}{2} = 28\tfrac{1}{2} \textit{ Ans.}$$

It follows that if the multiplier be itself a factor of the denominator, we may, to multiply a fraction by a whole number, divide the denominator by that number

(ii) When the multiplier is a fraction.

Example: In performing the operation 7×9, it is plain that we do to 7 what we do to a unit to obtain 9. Similarly, $^3/_5 \times ^4/_{11}$ may be looked upon as doing to $^3/_5$ what we do to the unit to obtain $^4/_{11}$.

Now, to obtain $^4/_{11}$ from the unit, we must divide the unit into 11 equal parts and take 4 of them.

Therefore, to find the value of $^3/_5 \times ^4/_{11}$ we must divide $^3/_5$ into 11 equal parts and take 4 of them.

But $^3/_5 = ^{33}/_{55} = ^3/_{55} \times 11$, so that, the eleventh part of $^3/_5$ is $^3/_{55}$; and, if we take 4 of these parts, we get $^3/_{55} \times 4$ or $^{12}/_{55}$.

Thus, $\frac{3}{5} \times \frac{4}{11} = \frac{12}{55}$. Now $12 = 3 \times 4$, and $55 = 5 \times 11$.

Hence we have the following rule: To multiply two fractions together, multiply the numerators for a new numerator and the denominators for a new denominator.

As in Example 2 the work is shortened if we cancel common factors from the numerators and denominators.

Example: Multiply $^{22}/_{91}$ by $^{13}/_{77}$.

$$\text{The product} = \frac{\overset{2}{\cancel{22}} \times \cancel{13}}{\underset{7}{\cancel{91}} \times \underset{7}{\cancel{77}}} = \frac{2}{49} \textit{ Ans.}$$

Here, the 22 of the numerator and the 77 of the denominator contain a common factor, 11. Therefore, we cross out the 22 and write 2 above it, and cross out the 77 and write 7 under it. Similarly, we cancel the factor 13 from 13 and 91. There is now 2 left for numerator and 7×7 for denominator.

To multiply more than two fractions together, we proceed in the same way.

In multiplication of fractions, mixed numbers must first be expressed as improper fractions.

Example: Simplify $5^1/_7 \times ^{11}/_{27} \times 1^{11}/_{24}$.

$$\text{Given expression} = \frac{\overset{\cancel{8}}{\cancel{26}}}{\underset{\cancel{7}}{\cancel{7}}} \times \frac{11}{\underset{9}{\cancel{27}}} \times \frac{\overset{5}{\cancel{35}}}{\underset{2}{\cancel{24}}} = \frac{55}{18} = 3\frac{1}{18} \textit{ Ans.}$$

Division of Fractions

(i) When the divisor is a whole number.

Suppose we have to divide $\frac{7}{9}$ by 4.

We know $\frac{7}{9} = \frac{28}{36}$. This fraction means that the unit is divided into 36 equal parts, and 28 of the parts taken. If we divide the 28 parts by 4, we get 7 of them—*i.e.* $^7/_{36}$. Hence $\frac{7}{9} \div 4 = ^7/_{36}$.

Therefore, to divide a fraction by a whole number, we multiply the denominator by that number.

In the same way as already explained for multiplication, we cancel any common factors contained in the divisor and the numerator. Hence, if the numerator be exactly divisible by the divisor, we may divide a fraction by a whole number by dividing the numerator by that number.

Example 1:

$$\frac{27}{31} \div 18 = \frac{\overset{3}{\cancel{27}}}{31 \times \underset{2}{\cancel{18}}} = \frac{3}{62} \textit{ Ans.}$$

Example 2:

$$\frac{36}{41} \div 9 = \frac{4}{41} \textit{ Ans.}$$

(ii) When the divisor is a fraction.

In the operation $24 \div 3$, we have to find the number which, when multiplied by 3, will give 24. Similarly, to find the value of $^3/_7 \div ^5/_9$ we have to find the fraction which, when multiplied by $^5/_9$, will give $^3/_7$.

But $\frac{3 \times 9}{7 \times 5}$ is the fraction which gives $^3/_7$ when multiplied by $^5/_9$. Therefore, $\frac{3}{7} \div \frac{5}{9} = \frac{3 \times 9}{7 \times 5}$.

Hence, to divide by a fraction, invert the divisor and multiply.

As in multiplication, mixed numbers must first be reduced to improper fractions.

EXAMPLE 3: Divide $3^1/_{14}$ by $5^5/_{42}$.

$$3\frac{1}{14} \div 5\frac{5}{42} = \frac{43}{14} \div \frac{215}{42} = \frac{\cancel{43}}{\cancel{14}} \times \frac{\overset{3}{\cancel{42}}}{\underset{5}{\cancel{215}}} = \frac{3}{5} \textit{ Ans.}$$

DECIMAL FRACTIONS

Differ in form from common fractions, in not having a written denominator; and from whole numbers, by having the decimal point (.) prefixed; which also separates the integral part from the decimal. The word decimal is derived from the Latin word *decem*, which signifies ten. The denominator of a decimal is always 10, or some power of 10, as 100, 1000, etc.

A Complex Decimal is a decimal with a common fraction at the right, as, .12½.

A Mixed Decimal is a whole number with a decimal fraction to its right, as, 34.5.

The denominations of United States money are based on the decimal system—the dollar occupying the unit's place, the dime the tenth's place, the cent the hundredth's place, and the mill the thousandth's place.

The rules given for addition, subtraction, and so on, also apply to decimals.

ADDITION IN DECIMALS

EXAMPLE: 27.295 + .0287 + 591.68 + 9.1846.

```
 27.295
   .0287
 591.68
   9.1846
 ———————
 628.1883 Ans.
```

Write the numbers so that the same powers of 10 come under one another, or, what is the same thing, write the numbers so that the decimal points come under one another. Then, adding the ten-thousandths first, 6, 13, carry 1, etc.

SUBTRACTION IN DECIMALS

EXAMPLE: Subtract .07295 from 21.651.

```
 21.651
   .07295
 ———————
 21.57805 Ans.
```

Write the first number under the second, so that the point comes under the point. Remember that we may consider there are 0's above the 9 and 5, since in 21.651 there are no ten-thousandths and no hundred-thousandths.

Say, mentally 5 and 5 make 10, carry 1.
10 and 0 make 10, carry 1.
3 and 8 make 11, carry 1, etc.

MULTIPLICATION IN DECIMALS

RULE.—Multiply as in whole numbers, and point off from the right of the product as many places as there are decimal places in both multiplier and multiplicand—prefixing ciphers if necessary.

EXAMPLE 1: What is the product of .417 multiplied by .34?

```
 .417
  .34
 ————
  1668
 1251
 ————
 .14178 Ans.
```

EXPLANATION.—The numbers may be multiplied as though they were integers. Since the multiplier contains 2 decimal places, and the multiplicand 3 decimal places, the product will contain 5 decimal places and the decimal point is placed before the fifth figure counting from the right.

EXAMPLE 2: Multiply 7.5864 by 200.

```
 7.5864
    200
 ———————
 1517.28 Ans.
```

EXPLANATION.—Since each removal of a figure one place to the left increases its value tenfold, the removal of the decimal point one place to the right multiplies by 10, and two places by 100. The product of 7.5864×100 is therefore 758.64, and this multiplied by 2 gives the product of 7.5864×200, which is 1517.28.

Note.—The number of decimal places in the product will always be equal to the sum of the number of decimal places in the multiplier and the multiplicand. Thus, in Example 2, there are two places of decimals (*i.e.* two figures to the right of the point) in 31.56, and two places of decimals in 5.49; and we found 2+2=4 places in the product 173.2644.

To multiply a decimal by 10, 100, etc.

RULE.—Remove the (.) as many places to the right as there are ciphers in the multiplier.

WORK:
8.75 × 10 = 87.5
8.75 × 100 = 875.
8.75 × 1000 = 8750.

DIVISION OF DECIMALS

RULE.—Divide as in whole numbers, annexing ciphers to the dividend, if necessary; then point off from the right of the quotient as many places as the decimal places in the dividend exceed those in the divisor—prefixing ciphers if necessary.

(a) Division of a decimal by a whole number.

EXAMPLE 1: Divide 18.2754 by 4.

```
4)18.2754
 ————————
  4.56885
```

We divide 4 into 18 (units) and have 4 (units) quotient and 3 units remainder. Since the 4 is the unit's figure of the quotient, we write the decimal point immediately after it. Then, the 2 units remainder and the 2 tenths of the dividend make 22 tenths to be divided by 4, and so on. Having reached the 4 (ten-thousandths) of the dividend, we find 8 (ten-thousandths) quotient and 2 remainder. This remainder is 20 hundred-thousandths, which when divided by 4 gives 5 (hundred-thousandths) and no further remainder.

EXAMPLE 2: Divide 18.2758 by 11.

```
11)18.2758
 ————————
  1.66143636
```

Here we find the digits 3, 6 repeated indefinitely in the quotient. Decimals of this sort will be fully considered later.

EXAMPLE 3: Divide 354.43 by 184.

```
184)354.43(1.92625 Ans.
    1704
    ————
     483
     ———
     1150*
     ————
      460
      ———
      920
      ———
```

Here we find the first figure of the quotient is obtained by dividing 184 into 354 units. Having now reached the decimal point in the dividend we also put the decimal point in the answer, and go on as before.

*At this stage there is a remainder 115 hundredths. We bring down 0 from the dividend, and obtain 1150 thousandths, etc.

(b) Division of a decimal.

EXAMPLE 4: Divide 10.6603 by 7.85.

Thus:

```
785)1066.03(1.358 Ans.
    ————————
     2810
     ————
      4553
      ————
       6280
       ————
```

Here 7.85 is 785 hundredths, and 10.6603 is 1066.03 hundredths; so that the required quotient is obtained by dividing 1066.03 by 785.

Therefore, to divide by a decimal, move the point as many places to the right as will make the divisor a whole number; move the point in the dividend the same number of places to the right. Then proceed as in Example 3.

EXAMPLE 5: Divide 176.4 by .00012.

```
12)17640000
 ———————————
Ans.1470000
```

Here, to make the divisor a whole number, we have to move the point 5 places. Therefore we also move the point 5 places to the right in the dividend, first writing enough 0's after the 176.4 to enable us to do so.

To divide a decimal by 10, 100, etc.

RULE.—Remove the (.) as many places to the left as there are ciphers in the divisor.

WORK:
62.5 ÷ 10 = 6.25
62.5 ÷ 100 = .625
62.5 ÷ 1000 = .0625

Expression of decimal fractions as common fractions.

EXAMPLE: Express 5.375 as a common fraction.

$$.375 = 375 \text{ thousandths.}$$

$$\text{Therefore } 5.375 = 5\frac{375}{1000} = 5\frac{3}{8} \textit{ Ans.}$$

RULE.—*Take the digits of the decimal for numerator; for the denominator put down 1 followed by as many ciphers as there are digits in the decimal. Reduce this fraction to its lowest terms.*

Expression of common fractions as decimals.

We have seen that a common fraction represents the quotient of the numerator divided by the denominator. Therefore, to convert a common fraction to a decimal fraction, we divide the numerator by the denominator.

EXAMPLE: Express $\frac{3}{32}$ as a decimal.

```
4)3.0
------
8) .75
------
 .09375 Ans.
```

It will be found in many cases that there is always a remainder, so that the quotient can be continued indefinitely.

CIRCULATING DECIMALS

The learner has already discovered that some common fractions cannot be changed to exact decimal fractions, as—

$\frac{1}{3} = .33333$ on to infinity.
$\frac{2}{3} = .66666$ on to infinity.
$^7/_{33} = .212121$, etc.

These decimals are known as *Circulates, Recurring* or *Circulating* decimals.

The part which recurs is called the *Repetend.*

This is marked by putting a dot over the first and last figures of it. For instance, if we write the 21 in the last case above, this way: $.\dot{2}\dot{1}$, it indicates that, if written out, the result would be 21212121, etc., on to infinity.

Where a circulating decimal occurs in work, it is best to reduce it to a common fraction. If need be, it may be expressed in the result as a circulate to any number of decimal places.

To change a pure circulate to a common fraction.

RULE.—Omit the (.) and write the figures of the repetend for the numerator, and as many 9's for the denominator as there are places in the repetend.

EXAMPLES: Change the pure circulates $.\dot{3}$, $.\dot{2}\dot{7}$, $.\dot{1}4285\dot{7}$, to common fractions.

$$.\dot{3}, \left(\frac{3}{9} = \frac{1}{3}\right) \textit{Ans. } \tfrac{1}{3}. \quad .\dot{2}\dot{7}, \left(\frac{27}{99} = \frac{3}{11}\right) \textit{Ans. } ^3/_{11}.$$

$$.\dot{1}4285\dot{7}, \left(\frac{142857}{999999} = \frac{1}{7}\right) \textit{Ans. } ^1/_7.$$

To change a mixed circulate to a common fraction.

RULE.—From the whole decimal subtract the finite part, and make the remainder the numerator. For the denominator, write as many 9's as there are figures in the repetend, and annex as many 0's as there are finite places.

EXAMPLE: Change the mixed circulates $.1\dot{6}$ and $.41\dot{6}$ to common fractions.

$$16 - 1 = 15, \frac{15}{90} = \frac{1}{6}. \quad \textit{Ans. } \tfrac{1}{6}.$$

$$416 - 41 = 375, \frac{375}{900} = \frac{5}{12}. \quad \textit{Ans. } ^5/_{12}.$$

To add, subtract, multiply and divide circulates, reduce them to common fractions, then apply the respective rules.

SHORT METHODS IN MERCHANDISING

When one of the numbers is an *aliquot part* of 100, the process of multiplication and division can often be very much shortened, as shown below.

Find cost of 27 yards of goods at $16\frac{2}{3}$c ($\$\frac{1}{6}$) per yard. At $1 per yard, 27 yards cost $27; at $\$\frac{1}{6}$, $(27 \div 6)$, $\$4\frac{1}{2}$. *Ans.* $\$4\frac{1}{2}$.

Find cost of a bale of cotton, 528 pounds at $8\frac{1}{3}$c ($\$^1/_{12}$) per pound. At $1 per pound, 528 pounds cost $528; at $\$^1/_{12}$ $(528 \div 12)$ $44. *Ans.* $44.

Find cost of 1845 pounds of iron, at $3\frac{1}{3}$c ($\$^1/_{30}$) per pound. Take $^1/_{30}$ of 1845, since $3\frac{1}{3}$c is $^1/_{30}$ of $1. $(1845 \div 30 = 61\frac{1}{2})$. *Ans.* $61\frac{1}{2}$.

Find cost of 16 pounds of butter at $37\frac{1}{2}$c ($\$\frac{3}{8}$) per pound. Here we take $\frac{3}{8}$ of 16. Say $\frac{1}{8}$ of 16 is 2, and $\frac{3}{8}$ is (2×3) 6. Or say 3 times 16 is 48, and $\frac{1}{8}$ of 48 is 6. *Ans.* $6.

Find cost of $17\frac{1}{2}$ bushels of apples at 75c ($\$\frac{3}{4}$) per bushel. The shortest way to find $\frac{3}{4}$ of $17.50 is to diminish it by $\frac{1}{4}$ of itself.

```
4)17.50   at $1
-------
 4.37½ at $¼
13.12½ at $¾
```

Ans. $13.12½.

At $6\frac{1}{4}$c per pound how much sugar will $5 buy? As $6\frac{1}{4}$c is $^1/_{16}$ of $1, evidently each dollar will buy 16 pounds. *Ans.* 80 pounds.

In multiplying by a fraction, write the quantity in a line with the numerator and cancel common factors.

Fin d cost of 72 yards of carpet, at $87\frac{1}{2}$c ($\$\frac{7}{8}$) a yard. Cancel 8, also 72 and write 9 instead. *Ans.* $63.

$$\frac{7 \times \cancel{72}\ 9}{\cancel{8}} = 63$$

Of 28 pounds of coffee, at $18\frac{3}{4}$c ($\$^3/_{16}$) per pound Cancel 28 and 16, write 7 and 4. *Ans.* $\$5\frac{1}{4}$.

$$\frac{3 \times \cancel{28}\ 7}{\cancel{16}\ 4} = \frac{21}{4} \text{ or } 5\tfrac{1}{4}$$

At $66\frac{2}{3}$c ($\$\frac{2}{3}$) per bushel, how many bushel of wheat will $34 buy? *Ans.* 51 bushel.

$$\frac{3 \times \cancel{34}\ 17}{\cancel{2}} = 51$$

In division, invert terms of fraction.

How much syrup, at $41\frac{2}{3}$c ($\$^5/_{12}$) per gallon can be bought for $15? *Ans.* 36 gallons.

$$\frac{12 \times \cancel{15}\ 3}{\cancel{5}} = 36$$

TABLE OF ALIQUOT PARTS OF 100

$3\frac{1}{3}$ is $^1/_{30}$	25 is $^1/_4$	50 is $^1/_2$	75 is $^3/_4$
$6\frac{1}{4}$ is $^1/_{16}$	$31\frac{1}{4}$ is $^5/_{16}$	$56\frac{1}{4}$ is $^9/_{16}$	80 is $^4/_5$
$8\frac{1}{3}$ is $^1/_{12}$	$33\frac{1}{3}$ is $^1/_3$	$58\frac{1}{3}$ is $^7/_{12}$	$81\frac{1}{4}$ is $^{13}/_{16}$
$12\frac{1}{2}$ is $^1/_8$	$37\frac{1}{2}$ is $^3/_8$	60 is $^3/_5$	$83\frac{1}{3}$ is $^5/_6$
$16\frac{2}{3}$ is $^1/_6$	40 is $^2/_5$	$62\frac{1}{2}$ is $^5/_8$	$87\frac{1}{2}$ is $^7/_8$
$18\frac{3}{4}$ is $^3/_{16}$	$41\frac{2}{3}$ is $^5/_{12}$	$66\frac{2}{3}$ is $^2/_3$	$91\frac{2}{3}$ is $^{11}/_{12}$
20 is $^1/_5$	$43\frac{3}{4}$ is $^7/_{16}$	$68\frac{3}{4}$ is $^{11}/_{16}$	$93\frac{3}{4}$ is $^{15}/_1$

Th s table embodies all the aliquot parts of 100 and their equivalent fractions which are generally used in practical calculations.

PROBLEMS IN GRAIN, STOCK, COTTON, COAL, HAY, LUMBER, ETC.

To find the value of articles sold by the unit, hundred or thousand.

RULE.—Multiply the quantity by the price, or vice versa, and point off the proper number of decimal places in the result.

Find the cost of a bale (518 pounds) of cotton at $7\frac{3}{8}$c per pound.

```
518 × .07 = 36.26        At 7c (.07) per pound. 518 pounds
  " .00⅜ = 1.94¼  cost $36.26; at ⅜c. $1.94¼. For
  ————————  ⅜ of 518. multiply by 3, and divide
Ans. $38.20¼  product by 8.
```

Find cost of a lot of hogs, weighing 8740 pounds, at $43.35 per hundredweight.

87.40
4.35
380.1900

The price being $4.35 per 100 pounds and as in 8740 pounds there are 87.40 hundredweight, four decimal places are pointed off. *Ans.* $380.19.

Find the cost of 2864 feet of lumber, at $17¼ per 1000 feet.

Price being dollars per 1000, point off three places. (2.864 × 17¼ = 49.404.) *Ans.* $49.40.

To find the value of articles sold by the ton (2000 pounds).

RULE.—Multiply the weight by the price and take half of the product.

Find the cost of 2680 pounds of hay, at $11½ per ton. Point off three places, when price is dollars; five if dollars and cents. (2680 × 11½ = 30820; 30820 ÷ 2 = 15.410.) *Ans.* $15.41.

When the long ton of 2240 pounds is used.

RULE.—Multiply the weight by the price and divide the product by 2.240.

Find the cost of 4800 pounds coal, at $6¾ per long ton. (4800 × 6¾) ÷ 2.24 = $14.46, *Ans.*

To find the cost of grain, when the price per bushel and weight is given.

RULE.—Reduce the weight to bushels, and multiply by the price.

Find the cost of 3570 pounds of shelled corn, at 36c per bushel.

56)3570 (63.75 bu.
.36
Ans. $22.9500

To reduce pounds of shelled corn to bushels, divide by 56. At 36c per bushel, 63.75 bushels come to $22.95.

Find cost of 2900 pounds of wheat, at 57c per bushel. To reduce pounds of wheat to bushels divide by 60. 2900 ÷ 60 = 48⅓ bushels; 48⅓ × .57 = $27.55, *Ans.*

In computing the value of grain, the operation can often be abbreviated by cancellation.

RULE.—Write the weight and price per bushel, on the right of a vertical line, and the number of pounds to the bushel on the left. Then cancel common factors, as explained above.

Find the cost of 3230 bushels of wheat, at 72c per bushel.

60 | 3230
72 12
323 × 12 = 38.76

Here we cancel the 0's on both sides; then, 6 and 72, which leaves 323 and 12. Their product being the answer.

At 28c per bushel, what will 4080 pounds of oats cost?

32 | 4080 510
4 | 28 7
Ans. $35.70

Oats, 32 pounds to the bushel. See table, page 861. Cancel 32 and 4080, then, 4 and 28, leaving the factors 510 and 7.

Other short cuts for computing cost of merchandise, produce, etc.

Find cost of 26½ dozen eggs, at 18½c a dozen.
26 × 18 = 4.68
½ of 44 = .22
½ × ½ = ¼ 4.90¼
Ans. $4.90.

When both fractions are ½. To product of the whole numbers, add ½ of their sum, and annex ¼ to answer.

Of 53¾ pounds of butter, at 28¾c per pound.
53 × .28 = 14.84
¾ of 81 = .60¾
¾ × ¾ = 9/16 15.45
Ans. $15.45 9/16.

To the product of the whole numbers, add ¾ of their sum, plus the square of ¾.

Of 13¼ yards of flannel, at 31¼c per yard.
13 × .31 = 4.03 + .11 = 4.14, *Ans.*

To 4.03 add .11, ¼ of 44 (13 + 31). The 1/16 (¼ × ¼) is disregarded.

DENOMINATE NUMBERS

Simple denominate numbers.—When we speak of measures, whether they are of money, extension, time, or weight, we use terms like 5 dollars, 4 yards, 3 hours, or 10 pounds to express the quantity we are talking about.

Sometimes we use two or more terms or names to express the measure, as 3 hours, 15 minutes, 10 seconds; 4 gallons, 3 quarts, 1 pint. *These are compound denominate numbers.*

The chief differences between compound numbers and simple numbers is, that with the exceptions of United States money, and the metric system of weights and measures, the denominations of compound numbers do not increase or decrease by the scale of ten.

REDUCTION.—Reduction of Compound Numbers is the process of changing them from one denomination to another without altering their value.

Reduction Descending is changing the denomination of a number to another that is lower, as: 2 hours = 120 minutes; 2 feet = 24 inches.

Reduction Ascending is changing the denomination of a number to another that is higher, as: 120 minutes = 2 hours; 24 inches = 2 feet.

RULES FOR ADDITION OF DENOMINATE NUMBERS

First.—Write the names of the different units to be used in addition, placing them in a horizontal row, the largest to the left.

Next.—Write the numbers of each unit to be added, below the names of the units, each in its proper place.

Then.—Add and place each sum below the column added.

EXAMPLE: Add 7 hours 15 minutes 30 seconds, 9 hours 30 minutes 40 seconds, and 11 hours 40 minutes 32 seconds.

WORK:

hours	minutes	seconds
7	15	30
9	30	40
11	40	32
28	26	42

EXPLANATION: 32 seconds + 40 seconds + 30 seconds = 102 seconds. But, 102 seconds = 1 minute 42 seconds. Write the 42 below and carry the 1 minute. 1 minute (carried) + 15 minutes + 30 minutes + 40 minutes = 86 minutes. But, 86 minutes = 1 hour 26 minutes. Write the 26 and carry the 1 hour. 1 hour + 11 hours + 9 hours + 7 hours = 28 hours. Result = 28 hours 26 minutes 42 seconds.

SUBTRACTION OF DENOMINATE QUANTITIES

EXAMPLE: Subtract 6 tons 12 cwt. 9 pounds 10 ounces from 15 tons 7 cwt. 13 pounds 9 ounces.

WORK:

Tons	Cwt.	Pounds	Ounces
15	7	13	9
6	12	9	10
8	15	3	15

EXPLANATION: (1) Place as in addition of denominate quantities. 10 ounces cannot be taken from 9 ounces, so we must take 1 pound from the 13 pounds and add it to the nine ounces. 16 ounces + 9 ounces = 25 ounces. 25 − 10 = 15. Write the 15 below.

(2) Now there are only 12 pounds left to take the 9 from. 12 − 9 = 3. Write the 3 below.

(3) 12 is larger than 7. 1 ton + 7 cwt. = 27 cwt. 27 − 12 = 15. Write the 15 below.

(4) 14 − 6 = 8. Write the 8 below.

(5) Result = 8 tons 15 cwt. 3 pounds 15 ounces.

MULTIPLICATION OF DENOMINATE QUANTITIES

EXAMPLE: Multiply 21 yards 2 feet 11 inches by 6.

WORK:

Yards	Feet	Inches
21	2	11
		6
131	2	6

EXPLANATION: (1) 6 × 11 inches = 66 inches = 5 feet 6 inches. Write the 6 below and carry the 5.

(2) 6 × 2 feet = 12 feet. 12 feet + 5 feet (carried) = 17 feet, or 5 yards 2 feet. Write the 2 below and carry the 5.

(3) 6 × 21 yards = 126 yards. 126 yards + 5 yards = 131 yards.

(4) Result = 131 yards 2 feet 6 inches.

Division of Denominate Quantities

Problem: Divide 3 years 9 months 4 days by 12.

Work

Years	Months	Days	Hours
12)3	9	4	0
0	3	22	20

Explanation: (1) We cannot divide 3 by 12, so we reduce 3 years to months. 3 years = 36 months. 36 months + 9 months = 45 months. 45 ÷ 12 = 3, and a remainder 9. Write the 3 and carry the remainder 9.

(2) 9 months (carried) = 270 days. 270 days + 4 days = 274 days. 274 ÷ 12 = 22, and a remainder 10. Write the 22 and carry the 10.

(3) 10 days = 240 hours. 240 ÷ 12 = 20. Write the 20.

(4) Result = 3 months 22 days 20 hours.

Reduction Ascending

Rules: 1. Divide the given denomination by the number which will reduce it to the next higher denomination. Divide the quotient in the same manner, and continue the operation until the entire quantity is reduced.

2. To the last quotient annex the several remainders in their proper order. The result will be the answer.

Example: Reduce 201458 inches to higher denominations.

Work:

12	201458 inches
3	16788 feet 2 inches
5½	5596 yards
2	2
11	11192 half yards
320	1017 rods 5 half yards
	3 miles 57 rods ‖
	2 yds. 1 ft. 6 in.

Solution:
201458 inches = 16788 feet 2 inches.
16788 feet 2 inches = 5596 yards 2 inches.
5596 yards 2 inches = 1017 rods 2 yards 1 foot 8 inches
1017 rods 2 yards 1 foot 8 inches = 3 miles 57 rods 2 yards 1 foot 8 inches.

201458 inches = 3 miles 57 rods 2 yards 1 foot 8 inches.

Reduction Descending

Rules: 1. Write the given quantity in the order of its denominations, beginning with the highest, and supply vacant denominations with ciphers.

2. Multiply the highest denomination by the number which will reduce it to the next lower denomination, and add to the product the units of the lower denomination, if there be any.

3. Proceed in the same manner until the entire quantity is reduced to the required denomination.

Example: Reduce 10 yards 8 feet 10 inches to inches.

Work:

Yards	Feet	Inches
10	8	10
3		
38		
12		
456		
10		
466		

Solution:
10 yards = 10 × 3 feet = 30 feet. 30 feet and 8 feet are 38 feet.
38 feet = 38 × 12 inches, or 456 inches. 456 inches + 10 inches = 466 inches.

Note.—To prove the above work, use reduction ascending, beginning with the result.

Long or Linear Measure

Long or linear measure is used in measuring lines and distances.

There are two systems in use in the United States, the *English System* and the *French System*. The English system is the one commonly used, while the French system is used in making scientific measurements. (See under Metric System.)

Table of Long Measure

12 inches (in.)	= 1 foot (ft.)
3 feet	= 1 yard (yd.)
5½ yards, or 16½ feet	= 1 rod (rd.)
320 rods, or 5280 feet	= 1 mile (mi.)
1760 yards	= 1 mile

mi.	rd.	yd.	ft.	in.
1 =	320 =	1760 =	5280 =	63360

Architects, carpenters, and mechanics frequently write ′ for foot, and ″ for inch. Thus 8′ 7″ means 8 feet 7 inches.

Other measures of length are:

1 hand = 4 in. Used in measuring the height of horses.
1 fathom = 6 ft. Used in measuring depths at sea.
1 knot, nautical or geographical mile = 1.1526⅔ miles or 6086 feet.

The knot is used in measuring distances at sea. It is equivalent to 1 minute of longitude at the equator.

Surveyors' Linear Measure

7.92 inches	= 1 link (l.)
25 links	= 1 rod (rd.)
4 rods or 100 links	= 1 chain (ch.)
80 chains	= 1 mile (mi.)

mi.	ch.	rd.	l.	in.
1 =	80 =	320 =	8000 =	63360

The linear unit commonly employed by surveyors is Gunter's chain, which is 4 rods or 66 feet.

An engineers' Chain, used by civil engineers, is 100 feet long, and consists of 100 links.

Measures of Length

The following measures of length are also used:

3 barleycorns	= 1 inch. Used by shoemakers.
4 inches	= 1 hand. Used to measure the height of horses.
6 feet	= 1 fathom. Used to measure depths at sea.
3 feet	= 1 pace. } Used in pacing distances.
5 paces	= 1 rod. }
8 furlongs	= 1 mile.
1.15 statute miles	= 1 geographical, or nautical mile.
3 geographical miles	= 1 league.
60 geographical miles / 69.16 statute miles	= 1 degree of Latitude on a Meridian, or of Longitude on the Equator.

The length of a degree of latitude varies. 69.16 miles is the average length, and is that adopted by the United States Coast Survey.

The standard unit of length is identical with the imperial yard of Great Britain.

The standard yard, under William IV., was declared to be fixed by dividing a pendulum which vibrates seconds in a vacuum, at the level of the sea, at 62 degrees Fahrenheit, in the latitude of London, into 391,393 equal parts, and taking 360,000 of these parts for the yard.

The following denominations also occur: The span = 9 inches; 1 common cubit (the distance from the elbow to the end of the middle finger) = 18 inches; 1 sacred cubit = 21.888 inches.

Surface Measures

Square Measure, used in measuring surfaces, such as cloth, ceilings, floors, etc.; paving, glazing, and stone-cutting, by the square foot; roofing, flooring, and slating by the square of 100 feet.

A surface has two dimensions, length and breadth.

A square is a figure that has four equal sides and four right angles.

The unit of measure for surfaces is a square, each of whose sides is a linear unit. Thus, a square inch is a square, each of whose sides is one inch long; a square foot is a square, each of whose sides is one foot long, etc.

The area of a square is the product of two of its sides. Thus, the area of a surface 3 feet square is 3 × 3 = 9 square feet.

Hence, to find the area of a rectangle:

Rule.—Multiply the length by the breadth expressed in units of the same denomination.

As the area of a rectangle is found by taking the product of the numbers representing its length and breadth, it is evident that if the area be divided by either of those numbers, the quotient will be the other number. Hence, to find either side of a rectangle when its area and the other side are given:

RULE.—Divide the area by the given side. The quotient will be the required side.

TABLE OF SQUARE MEASURE

144 square inches (sq. in.)	= 1 square foot (sq. ft.)
9 square feet	= 1 square yard (sq. yd.)
30¼ square yards	= 1 square rod (sq. rd.)
160 square rods	= 1 acre (A.)
640 acres	= 1 square mile (sq. mi.)

Sq. ′ and sq. ″ are frequently used for square foot and square inch. Thus, 15 sq.′ 6 sq.″ means 15 square feet 6 square inches.

A square is 100 square feet. It is used in measuring roofing.

PRACTICAL APPLICATION OF SQUARE MEASURE

PAPERING

Facts about Wall Paper:

(1) Wall paper in this country is ½ yard wide, and comes in rolls 8 yards long, or in double rolls, 16 yards long.

(2) It is sold by the roll only.

(3) Bordering is sold by the linear yard.

(4) Make liberal allowances for waste in matching figures.

(5) If the border is wide, the strips need not extend to the ceiling.

Rules for Measuring:

(1) Measure the distance around the room in feet.

(2) Deduct the width of doors and windows.

(3) Divide the difference by 1½, and the quotient will be the number of strips needed.

(4) Multiply the number of strips by the number of yards in a strip, and the product is the *number of yards needed*, approximately.

(5) Divide the number of yards by 8, and the result is the *number of single rolls needed*.

EXAMPLE: A room of ordinary height, 16 feet by 24 feet, has three windows and 2 doors, each 4 feet wide. How many rolls of paper are needed to paper the sides?

SOLUTION:

Distance around the room	=	80 feet
Width of doors and windows	=	20 feet

After deducting for doors and windows 60 feet
60 ÷ 7 = 8⁴/₇, or 9 double rolls.

CARPETING

Facts about Carpets:

(1) Carpets are usually ¾ yard wide and are sold by the linear yard.

(2) Always draw a diagram of the floor or stairs to be covered.

(3) The number of yards required depends on which way the strips run—whether lengthwise or across the room. Sometimes by running the strips lengthwise, there is less waste in matching the pattern.

(4) The part cut off in matching patterns is charged to the purchaser.

Rules for Estimating:

The number of yards required will be the number of yards in a strip (including the waste for matching), multiplied by the number of strips.

EXAMPLE: What is the cost of carpeting a room 16 feet by 24 feet at 85c per yard? The carpet is 2¼ feet wide and the strips run lengthwise.

SOLUTION:
16 ÷ 2¼ = 7¹/₉. Hence, I must buy 8 strips.
24 ÷ 3 = 8, which is the number of yards in a strip.
8 × 8 yards = 64 yards.
64 yards will cost 64 × 85c, or $54.40.

To this must be added the cost of sewing, the laying of the carpet, and the waste in matching the pattern.

LAND MEASURE

RULE.—To find the number of acres in a tract of land, divide the number of square rods by 160, or number of square chains by 10.

EXAMPLE: (1) How many square rods, also acres, in a field 80 rods long and 62½ rods wide?

80 × 62½ = 5000 square rods; 5000 ÷ 160 = 31¼ acres. *Ans.* 31¼ acres.

(2) In tract, 79 chains 84 links (79.84 chains) by 41 chains 25 links (41.25 chains)?

79.84 × 41.25 = 3293.4 square chains; 3293.4 ÷ 10 = 329.34 acres. *Ans.* 329.34 acres.

Table showing one side of a Square Tract or Lot containing

1	acre	=	208.7	feet	=	43,560 square feet
1½	acres	=	255.6	feet	=	65,340 square feet
2	acres	=	295.2	feet	=	87,120 square feet
2½	acres	=	330	feet	=	108,900 square feet
3	acres	=	361.5	feet	=	130,680 square feet
5	acres	=	466.7	feet	=	217,800 square feet
10	acres	=	660	feet	=	435,600 square feet
1/10	acre	=	66	feet	=	4,356 square feet
⅛	acre	=	73.8	feet	=	5,445 square feet
1/6	acre	=	85.2	feet	=	7,260 square feet
¼	acre	=	104.4	feet	=	10,890 square feet
⅓	acre	=	120.5	feet	=	14,520 square feet
½	acre	=	147.6	feet	=	21,780 square feet
¾	acre	=	180.8	feet	=	32,670 square feet

TABLE OF SURVEYORS' SQUARE MEASURE

272½ square feet	= 1 square rod
16 square rods	= 1 square chain
160 square rods, or 10 square chains	= 1 acre
640 acres	= 1 square mile, or section
36 square miles, or 36 sections	= 1 township

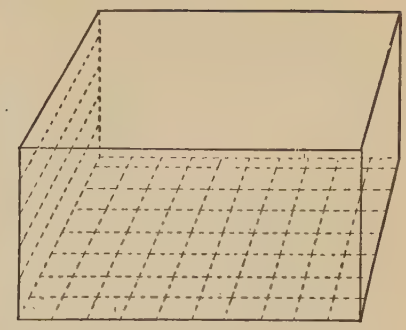
TEXAS LAND MEASURE

(Also used in Mexico, New Mexico, Arizona, and California)

26,000,000	square varas (square of 5,099	varas)	= 1 league and 1 labor	= 4,605.5	acres
1,000,000	square varas (square of 1,000	varas)	= 1 labor	= 177.136	acres
25,000,000	square varas (square of 5,000	varas)	= 1 league	= 4,428.4	acres
12,500,000	square varas (square of 3,535.5	varas)	= ½ league	= 2,214.2	acres
8,333,333	square varas (square of 2,886.7	varas)	= ⅓ league	= 1,476.13	acres
6,250,000	square varas (square of 2,500	varas)	= ¼ league	= 1,107.1	acres
7,225,600	square varas (square of 2,688	varas)		= 1,280	acres
3,612,800	square varas (square of 1,900.8	varas)	= 1 section	= 640	acres
1,806,400	square varas (square of 1,344	varas)	= ½ section	= 320	acres
903,200	square varas (square of 950.44	varas)	= ¼ section	= 160	acres
451,600	square varas (square of 672	varas)	= ⅛ section	= 80	acres
225,800	square varas (square of 475	varas)	= 1/16 section	= 40	acres
5,645.376	square varas (square of 75.137	varas)	= 4,840 square yards	= 1	acre

To find the number of acres in any number of square varas, multiply the latter by 177 (or to be more exact, by 177⅛), and cut off six decimals.

1 vara = 33⅓ inches 1,900.8 varas = 1 mile.



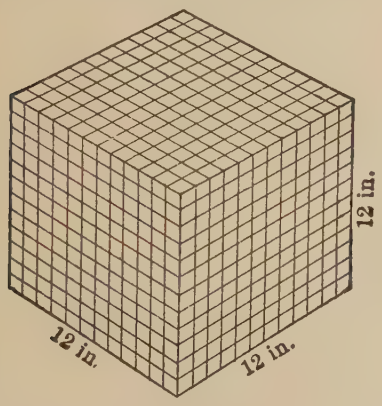
THE MEASURE OF SOLIDS, OR CUBIC MEASURE

Just as the rectangle is the chief surface considered in arithmetic, so the rectangular solid is the chief solid body.

A rectangular solid is bounded by six rectangular surfaces, each opposite pair of rectangles being equal and parallel to each other.

A rectangular solid thus has three dimensions —length, breadth, and thickness.

If the length, breadth, and thickness are all equal to one another, the solid is called a cube. Hence, a cubic foot, the unit of volume, is a solid body whose length, breadth, and thickness are each a linear foot. Similarly, a cubic inch measures one linear inch in length, breadth, and thickness; and a cubic yard measures one linear yard in length, breadth, and thickness.



One cubic foot

The number of cubic feet (or inches, or yards) in the volume of a rectangular solid is equal to the number of linear feet (or inches, or yards) in the length, multiplied by the number of linear feet (or inches, or yards) in the breadth, multiplied by the number of linear feet (or inches, or yards) in the thickness.

This is usually abbreviated into

Length × breadth × thickness = volume, or cubic content.

For, suppose the solid in the diagram is 10 feet in length, 8 feet in breadth, and 5 feet in thickness. It is clear that the solid can be cut into five slices, each 1 foot thick, by planes parallel to the bottom. But, the bottom contains 10×8 square feet and above each square foot there is a cubic foot. Thus, each slice contains 10×8 cubic feet. Therefore, since there are five slices, the whole solid contains 10×8×5, or 400 cubic feet.

Since length × breadth × thickness = cubic content, it follows that, if we know any three of these four quantities, we can find the fourth.

The student should remember that

(a) A cubic foot of water weighs 1000 ounces (avoirdupois) approximately.

(b) A gallon of pure water weighs 10 pounds (avoirdupois).

We have thus a relation between weight, capacity, and cubic content.

Table of Cubic Measure

1728 cubic inches (cu. in.) = 1 cubic foot (cu. ft.)
27 cubic feet = 1 cubic yard (cu. yd.)
128 cubic feet = 1 cord (C.)

Cubic Yard		Cubic Feet		Cubic Inches
1	=	27	=	46656

A *cord* of wood or stone is a pile 8 feet long, 4 feet wide, and 4 feet high.

A pile of wood 4 feet high, 4 feet wide and 1 foot long makes a *cord foot*. 8 cord feet = 1 cord.

A *perch* of stone or masonry is 16½ feet long, 1½ feet thick, and 1 foot high, and contains 24¾ cubic feet.

A *cubic yard* of earth is considered a *load*

Brick work is commonly estimated by the thousand bricks.

Bricklayers, masons, and joiners commonly make a deduction of one half the space occupied by windows and doors in the walls of buildings.

In computing the contents of walls, masons and bricklayers multiply the entire distance around on the outside of the wall by the height and thickness. The corners are thus measured twice.

A cubic foot of distilled water at the maximum density, at the level of the sea, and the barometer at 30 inches, weighs 62½ pounds or 1000 ounces avoirdupois.

By actual measurements, it has been found that a bushel, dry measure, contains about 1¼ cubic feet. This makes it easy to estimate about how many bushels any bin will hold.

Practical Applications of Cubic Measure

Example: An open tank made of iron ¼ inch thick, is 4 feet long, 2 feet 6 inches broad, and 2 feet deep, outside measurement. Assuming that iron weighs 7.8 times as much as water, find the weight of the tank.

The external volume of the tank = 2×2½×4 cubic feet = 20 cubic feet.

Since the iron is ¼ inch thick, the inside length is ½ inch less than the outside, the inside breadth is ½ inch less than the outside, and the inside depth is ¼ inch less than the outside.

Therefore the interior volume

$$=29\tfrac{1}{2}\times47\tfrac{1}{2}\times23\tfrac{3}{4} \text{ cubic inches}$$

$$=\frac{59\times95\times95}{16} \text{ cubic inches}$$

$$=33279\tfrac{11}{16} \text{ cubic inches}$$

Therefore, volume of iron in the tank

$$=20 \text{ cubic feet} - 33279\tfrac{15}{16} \text{ cubic inches}$$
$$=1280\tfrac{5}{16} \text{ cubic inches.}$$

But 1 cubic foot of iron weighs as much as 7.8 cubic feet of water, *i. e.*, 7.8×1000 ounces, or 7800 ounces.

$$\therefore \text{Weight of tank} = \frac{1280\tfrac{5}{16} \times 7800}{1728 \times 16} \text{ pounds.}$$
$$=361.199 \text{ pounds, } \textit{Ans.}$$

EXAMPLE: A wood pile is 8 feet high and 40 feet long. The sticks are 4 feet long. How many cords in it?

SOLUTION: Being 8 feet high, it is 2 cords high. 40 feet in length equal 5 cords in length. Hence, the pile contains 2×5 cords, or 10 cords.

To estimate a bin:

(1) Find the number of cubic feet in the bin.
(2) Divide the number of cubic feet by $1\frac{1}{4}$.
(3) The result is the number of bushels.

EXAMPLE: How many bushels will a bin hold, if its inside measurements are, length 20 feet, width 12 feet, depth 8 feet?

SOLUTION: The number of cubic feet in a bin is $8 \times 12 \times 20$, or 1920.

If 1 bushel contains $1\frac{1}{4}$ cubic feet, in 1920 cubic feet there are as many bushels as $1\frac{1}{4}$ is contained times in 1920, or 1536.

WORK:

$$8 \times 12 \times 20 = 1920$$
$$1920 \div 1\tfrac{1}{4} = 1536.$$

The work may be indicated in this way as well:—

$$8 \times 12 \times \overset{4}{20} \times \tfrac{4}{5} = 1536.$$

To get the number of heaped bushels of corn in the ear in a crib:

(1) Multiply the length of the crib in inches by the width in inches.

(2) Multiply the product obtained, by the height of the corn in the crib in inches.

(3) Divide the result by 2748.

EXAMPLE: How much corn in the ear can I put into a crib 12 feet wide, 20 feet long, and 10 feet deep?

SOLUTION: The number of cubic inches in the crib is $144 \times 240 \times 120$, or 4,147,200.

Since 2748 cubic inches hold 1 bushel, 4,147,200 cubic inches hold as many bushels as 2748 is contained times in 4,147,200, or 1509+ bushels.

WORK:

$$\frac{144 \times 240 \times 120}{2748} = 1509+.$$

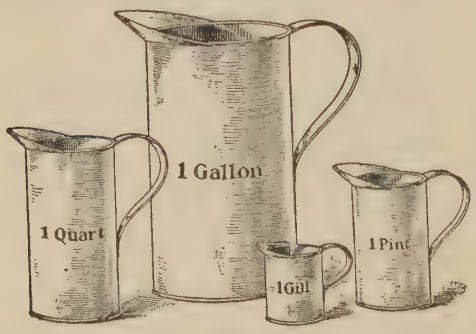
MEASURES OF CAPACITY

Measures used in telling the extent of room in vessels are called *measures of capacity*.

There are two kinds of capacity measures, dry measures and liquid measures.

Dry measures are used to measure grain, seeds, and the like.

Liquid measures are used to measure water, milk, oils, etc.



Liquid measures

COMMON LIQUID MEASURE TABLE

4 gills (gi.)	=	1 pint (pt.)
2 pints	=	1 quart (qt.)
4 quarts	=	1 gallon (gal.)
$31\frac{1}{2}$ gallons	=	1 barrel (bbl.)
2 barrels	=	1 hogshead (hhd.)

Gallon		Quarts		Pints		Gills
1	=	4	=	8	=	32

A pint, quart, or gallon, dry measure, is more than the same quantity, liquid measure; for a quart, dry measure, is $\frac{1}{32}$ of a bushel, or $\frac{1}{32}$ of 2150.4 cubic inches, which is about $67\frac{1}{5}$ cubic inches, while a quart liquid measure is $\frac{1}{4}$ of 231 cubic inches, or $57\frac{3}{4}$ cubic inches.

	Cu. In. in 1 Gal.	Cu. In. in 1 Qt.	Cu. In. in 1 Pt.	Cu. In. in 1 Gi.
Liquid measure	231	$57\frac{3}{4}$	$28\frac{7}{8}$	$7\frac{1}{32}$
Dry measure	$268\frac{4}{5}$	$67\frac{1}{5}$	$33\frac{3}{5}$	$8\frac{2}{5}$

In determining the capacity of cisterns, reservoirs, etc., $31\frac{1}{2}$ gallons are considered a barrel (bbl.), and 2 barrels, or 63 gallons, a hogshead (hhd.). In commerce, however, the barrel and hogshead are not fixed measures.

Casks of large size, called tierces, pipes, butts, tuns, etc., do not hold any fixed quantity. Their capacity is usually marked upon them.

The standard gallon of the United States contains 231 cubic inches, and will hold a little over $8\frac{1}{3}$ pounds of distilled water. The imperial gallon, now adopted by Great Britain, contains 277.274 cubic inches, or 10 pounds of distilled water, temperature 62 degrees Fahrenheit, the barometer standing at 30 inches.

TABLE OF APOTHECARIES' LIQUID MEASURE

These measures are used in mixing medicines.

60 minims (m)	=	1 fluid dram (ʃ3)
8 fluid drams	=	1 fluid ounce (ʃ3)
16 fluid ounces	=	1 pint (*O.*)
8 pints	=	1 gallon (*Cong.*)

A minim is about 1 drop.

TABLE OF DRY MEASURE

2 pints (pt.)	=	1 quart (qt.)
8 quarts	=	1 peck (pk.)
4 pecks	=	1 bushel (bu.)

Bushel		Pecks		Quarts		Pints
1	=	4	=	32	=	64

A common Winchester bushel (the standard of the United States) contains 2150.42 cubic inches.

A dry quart contains 67.2 cubic inches.

A liquid quart contains 57.75 cubic inches.

EXAMPLE 1: Reduce 5 bushels 2 pecks 4 quarts 1 pint to pints.

OPERATION:

	4	8	2
bu.	pk.	qt.	pts.
5	2	4	1
4			
22 pk.			
8			
180 qt.			
2			
361 pt.			

EXPLANATION: As there are 4 pecks in 1 bushel, any number of bushels is equal to 4 times that number of pecks. Then, 5 bushels = 20 pecks, and 2 pecks added make 22 pecks. As there are 8 quarts in 1 peck, any number of pecks is equal to 8 times that number of quarts. Then 22 pecks = 176 quarts, and 4 quarts added make 180 quarts. As there are 2 pints in 1 quart, any number of quarts is equal to 2 times that number of pints. Then, 180 quarts = 360 pints, and 1 pint added make 361 pints. Hence 5 bushels 2 pecks 4 quarts 1 pint = 361 pints.

EXAMPLE 2: Reduce 361 pints to bushels.

OPERATION:

2	361 pt.
8	180 qt. + 1 pt.
4	22 pk. + 4 qt.
	5 bu. + 2 pk.

EXPLANATION: As there are 2 pints in 1 quart, 361 pints are equal to one-half that number of quarts = 180 quarts, with a remainder of 1 pint. Also, 180 quarts are equal to one-eighth of that number of pecks = 22 pecks, with a remainder of 4 quarts. Finally, 22 pecks are equal to one-fourth of that number of bushels = 5 bushels, with a remainder of 2 pecks. Hence, 361 pints are equal to 5 bushels 2 pecks 4 quarts 1 pint.

MEASURES OF WEIGHT

AVOIRDUPOIS WEIGHT

Avoirdupois Weight is used for weighing heavy articles as grain, groceries, coarse metals, etc.

16 ounces (oz.)	=	1 pound (lb.)
100 pounds	=	1 hundredweight (cwt.)
20 hundredweight	=	1 ton (T.)

Ton		Hundred-weight		Pounds		Ounces
1	=	20	=	2000	=	32000

Scale.—20, 100, 16.

In weighing coal at the mines and in levying duties at the United States Custom House, the long ton of 2240 pounds is sometimes used.

The ounce is considered as 16 drams.

The unit is the pound. It contains 7000 grains.

The following denominations are also used:

14 pounds	= 1 stone
100 pounds butter	= 1 firkin
100 pound grain or flour	= 1 cental
100 pounds dried fish	= 1 quintal
100 pounds nails	= 1 keg
196 pounds flour	= 1 barrel
200 pounds pork or beef	= 1 barrel
280 pounds salt at N. Y. works	= 1 barrel

Troy Weight

Troy Weight is used in weighing gold, silver, and jewels.

TABLE

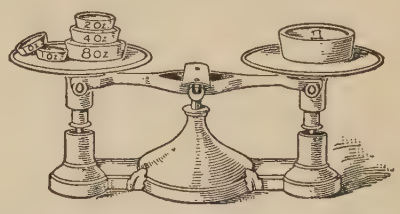
24 grains (gr.)	= 1 pennyweight (pwt.)
20 pennyweights	= 1 ounce (oz.)
12 ounces	= 1 pound (lb.)

Pounds		Ounces		Penny-weights		Grains
1	=	12	=	240	=	5760

In weighing diamonds, pearls, and other jewels, the unit commonly employed is the *carat*, which is equal to 4 carat grains, or 3.168 Troy grains.

The term *carat* is also used to express the fineness of gold, and means $^1/_{24}$ part. Thus, gold that is 18 carats fine is $^{18}/_{24}$ gold, and $^6/_{24}$ alloy.

The *standard unit* of weight is the *Troy pound*. It is equal to the weight of 22.7944 cubic inches of distilled water at its maximum density, the barometer being at 30 inches. It is identical with the Troy pound of Great Britain.



The following are approximate avoirdupois weights of certain articles of produce according to the laws of the United States, and in the majority of States:

Table I. UNITED STATES LEGAL WEIGHTS (*in pounds*) **PER BUSHEL**

Prepared by the United States Bureau of Standards

State or Territory	Apples		Barley	Beans		Beets	Blue-Grass Seed	Bran*	Broom-Corn Seed	Buckwheat	Carrots	Clover Seed	Coal	Coke	Corn		Corn Meal*
	Apple*	Dried Apples		Beans*	Castor Beans, Shelled										Corn in Ear	Shelled Corn	
United States	....	....	48	60	50	....	....	....	....	48	....	....	80	....	....	....	....
Alabama	....	24	47	60	....	....	....	....	....	....	....	....	....	....	70	56	....
Arizona	....	....	45	*a*55	....	....	....	....	....	....	....	....	....	....	....	....	....
Arkansas	*b*50	24	48	*a*60	....	....	14	20	48	52	....	60	....	....	70	56	48
California	....	....	50	....	....	....	....	....	....	40	....	....	....	....	....	....	....
Colorado	....	....	48	60	....	....	14	....	....	52	....	60	80	....	70	....	50
Connecticut	48	25	48	60	....	*c*60	....	20	....	48	50	60	80	....	....	....	50
Delaware	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Florida	*b*48	24	48	*d*60	48	....	....	20	....	....	....	....	....	....	70	56	48
Georgia	....	24	47	*e*60	....	....	14	*f*20	....	52	....	60	80	....	70	56	48
Hawaii	....	....	48	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Idaho	....	28	48	....	....	....	....	....	....	42	....	60	....	....	....	56	....
Illinois	....	24	48	*e*60	46	....	14	20	....	52	....	60	80	....	70	56	48
Indiana	....	25	48	60	46	....	14	....	....	50	....	60	80	....	*g*68	56	50
Iowa	48	24	48	60	46	56	14	20	50	52	50	60	80	38	70	56	50
Kansas	*b*48	24	48	60	46	56	*h*14	20	....	50	50	60	80	....	70	*i*56	....
Kentucky	....	24	47	*e*60	*45	....	14	20	....	56	....	60	76	....	*j*70	56	50
Louisiana	....	....	32	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Maine	44	....	48	60	....	60	....	....	....	48	50	....	....	....	....	....	50
Maryland	....	28	....	....	50	....	14	20	....	....	50	60	80	....	....	56	48
Massachusetts	48	25	48	*k*60	....	60	....	20	....	48	50	60	....	....	....	*l*56	50
Michigan	48	22	48	60	46	....	14	....	....	48	....	60	80	....	70	56	50
Minnesota	*b*50	28	48	60	....	50	14	....	57	50	45	60	80	....	70	56	....
Mississippi	....	26	48	*e*60	*m*46	....	14	20	....	48	....	60	80	....	72	56	48
Missouri	48	24	48	*m*60	46	....	14	20	....	52	50	60	80	....	70	56	50
Montana	45	....	48	60	....	50	14	20	....	52	50	60	76	....	70	56	50
Nebraska	48	24	48	*e*60	46	....	14	20	....	52	....	60	80	....	70	56	50
Nevada	*b*48	24	48	60	46	56	*h*	20	....	50	50	60	....	....	70	56	48
New Hampshire	48	25	48	62	....	60	....	20	....	48	50	60	....	....	*e*50	....	50
New Jersey	50	25	48	60	....	60	....	....	....	50	50	64	....	....	....	....	....
New York	48	25	48	60	....	....	....	20	....	48	50	60	....	....	....	....	50
North Carolina	48	....	48	....	*46	....	14	....	46	50	....	60	....	....	....	....	48
North Dakota	50	....	48	60	....	60	....	20	30	42	....	60	80	....	70	56	....
Ohio	50	24	48	60	....	56	....	....	....	50	50	60	*n*80	40	68	56	....
Oklahoma	48	24	48	60	....	60	14	20	30	52	50	60	80	....	70	56	50
Oregon	45	28	46	....	....	....	....	....	....	42	....	60	....	....	....	....	....
Pennsylvania	....	....	47	....	....	....	....	....	....	48	....	60	*o*76	40	....	....	....
Rhode Island	48	25	48	60	46	50	....	20	....	48	50	60	80	40	70	56	50
South Carolina	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	48
South Dakota	....	....	48	60	....	60	....	20	30	42	....	60	80	....	70	56	....
Tennessee	*b*50	24	48	*p*60	46	50	14	20	42	50	50	*q*60	80	40	70	56	....
Texas	45	28	48	*e*60	....	....	....	20	....	42	....	60	80	....	70	56	....
Vermont	46	....	48	62	....	60	....	....	....	48	50	60	....	....	....	....	....
Virginia	45	28	48	*e*60	....	....	14	....	....	52	....	60	80	....	70	56	50
Washington	*b*45	28	48	....	....	....	....	....	....	42	....	60	....	....	....	....	....
West Virginia	....	25	48	60	....	....	....	....	....	52	....	60	80	....	....	....	....
Wisconsin	50	25	48	60	....	50	....	20	....	50	50	60	....	....	....	....	50

UNITED STATES LEGAL WEIGHTS (*in pounds*) PER BUSHEL—Continued

State or Territory	Corn Meal, Bolted	Corn Meal, Unbolted	Cotton Seed		Cranberries	Flaxseed (Linseed)	Gooseberries	Plastering Hair	Hemp Seed	Herdes Grass	Hungarian Grass Seed	Millet	Oats	Onions		Orchard Grass Seed	Osage Orange Seed	Parsnips	Peaches
			Cotton* Seed	Sea-Island										Onions*	Onion Sets				
United States	...	...	...	...	...	56	...	...	...	...	...	...	32	57	...	...	...	...	...
Alabama	...	...	32	...	...	...	...	...	...	...	...	...	32	...	...	...	...	...	...
Arizona	...	...	...	...	...	...	...	...	...	...	...	...	32	...	...	...	...	...	...
Arkansas	...	...	33½	...	...	56	...	...	...	...	...	50	32	57	...	14	...	...	...
California	...	...	...	...	...	...	...	...	...	...	...	...	32	...	...	...	...	...	...
Colorado	...	...	...	...	...	...	...	...	44	...	...	...	32	57	...	...	...	...	...
Connecticut	...	...	30	44	...	55	...	...	...	45	...	...	32	52	...	...	...	45	...
Delaware	44	48	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Florida	...	...	32	46	...	...	...	...	...	...	...	50	32	56	...	...	...	...	54
Georgia	...	...	30	...	...	56	...	8	44	...	...	...	32	57	...	...	...	...	...
Hawaii	...	...	...	...	...	...	...	...	...	...	...	...	32	...	...	...	...	...	...
Idaho	...	...	...	...	...	56	...	...	...	...	...	...	36	...	...	...	...	...	...
Illinois	...	...	...	...	...	56	...	8	44	...	...	...	32	57	...	...	...	...	...
Indiana	...	...	...	...	33	...	...	...	44	...	...	50	32	48	...	14	33	55	...
Iowa	...	...	...	...	...	56	40	...	44	...	50	50	32	57	...	14	32	42	48
Kansas	...	...	...	...	...	56	...	r8	44	...	50	50	32	57	...	...	...	52	48
Kentucky	...	...	...	...	...	56	...	8	44	...	50	50	32	57	36	14	...	...	...
Louisiana	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Maine	...	...	...	...	...	...	...	11	...	45	...	...	32	52	...	...	...	45	...
Maryland	...	...	...	...	...	56	...	...	44	45	50	50	32	57	...	14	...	...	40
Massachusetts	...	...	30	44	32	55	...	...	...	45	...	...	32	52	...	...	...	45	48
Michigan	...	...	...	...	40	56	...	...	44	...	50	50	32	54	...	14	33	...	...
Minnesota	...	...	...	...	36	...	40	r8	50	...	48	48	32	52	...	14	...	42	...
Mississippi	44	48	32	...	...	56	...	...	44	...	50	50	32	57	...	...	...	...	...
Missouri	...	...	33	...	...	56	...	...	44	...	48	50	32	57	28	14	36	44	48
Montana	...	...	...	...	...	56	...	...	44	...	50	...	32	57	...	...	...	50	...
Nebraska	...	...	...	...	...	56	...	8	44	...	50	50	32	57	25	...	32	...	...
Nevada	...	...	...	...	...	56	...	...	48	...	50	50	32	57	...	...	...	50	48
New Hampshire	...	...	...	...	32	56	...	...	...	45	...	...	32	52	...	...	...	45	48
New Jersey	...	...	...	...	...	55	...	...	...	...	...	...	30	57	...	...	...	...	50
New York	...	...	30	44	...	55	...	...	...	45	...	...	32	57	...	...	...	...	...
North Carolina	48	48	30	44	...	55	...	...	44	...	...	50	32	57	...	14	...	...	...
North Dakota	...	...	...	...	...	56	...	...	...	...	...	50	32	52	...	...	...	...	...
Ohio	...	...	...	...	...	56	...	...	44	...	50	50	32	55	...	...	...	...	48
Oklahoma	...	...	32	...	...	56	...	...	44	...	...	50	32	57	28	14	36	44	48
Oregon	...	...	...	...	...	...	...	...	...	...	...	...	32	...	...	...	...	...	...
Pennsylvania	...	...	...	...	...	...	...	...	...	...	...	...	32	50	...	...	...	...	...
Rhode Island	...	...	30	44	...	56	...	...	44	...	50	50	32	50	...	...	...	50	48
South Carolina	48	48	30	...	...	...	...	...	...	...	...	...	...	52	...	...	...	...	...
South Dakota	...	...	...	...	...	56	...	...	...	...	...	...	32	52	...	...	...	...	...
Tennessee	50	48	28	...	...	56	48	8	44	...	48	50	32	56	28	14	33	50	50
Texas	...	...	32	...	...	56	...	...	44	...	48	50	32	57	...	...	...	...	50
Vermont	...	...	...	...	...	...	...	...	...	45	...	...	32	52	...	...	...	...	...
Virginia	...	...	32	...	...	56	...	8	44	12	48	50	30	57	28	14	34	...	...
Washington	...	...	...	...	...	56	...	...	...	...	...	...	32	...	...	...	...	...	...
West Virginia	...	...	...	...	...	56	...	...	...	...	...	...	32	...	...	...	...	...	...
Wisconsin	...	...	30	44	...	56	...	8	44	...	48	50	32	57	...	...	...	44	...

UNITED STATES LEGAL WEIGHTS (*in pounds*) PER BUSHEL—Continued

State or Territory	Dried Peaches Peeled	Peanuts	Pears*	Peas		Potatoes	Sweet Potatoes	Redtop Seed	Rough Rice	Rutabagas	Rye Meal	Rye	Shorts*	Sorghum Seed	Tomatoes	Timothy Seed	Turnips	Wheat
				Green Peas Unshelled	Peas*													
United States	...	...	...	...	60	60	...	...	...	...	...	56	...	...	...	...	...	60
Alabama	38	...	...	...	60	60	55	...	...	...	...	56	...	...	...	...	55	60
Arizona	...	...	...	...	...	...	...	...	...	...	...	56	...	...	...	...	...	60
Arkansas	33	...	...	...	60	60	50	14	...	...	...	56	...	50	...	60	57	60
California	...	...	...	...	...	...	...	...	...	...	...	54	...	...	...	...	...	60
Colorado	...	...	...	...	...	60	...	...	...	...	...	56	...	...	...	45	...	60
Connecticut	33	...	...	...	60	60	54	...	45	60	50	56	20	...	...	...	50	60
Delaware	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	60
Florida	33	22	60	...	...	60	60	...	...	...	...	56	...	56	...	...	54	60
Georgia	38	...	...	...	60	60	55	...	43	...	...	56	...	...	...	45	55	60
Hawaii	...	25	...	...	...	...	...	...	...	...	...	56	...	...	...	...	...	60
Idaho	...	...	45	...	...	60	...	...	...	...	...	56	...	...	...	...	...	60
Illinois	...	...	...	...	...	60	50	...	...	...	...	56	...	...	...	45	55	60
Indiana	...	...	...	...	...	60	55	...	...	...	...	56	...	...	...	45	55	60
Iowa	...	20	...	50	60	60	46	14	...	50	...	56	...	50	50	45	55	60
Kansas	...	...	...	...	...	60	50	...	...	...	...	56	...	50	56	45	55	60

UNITED STATES LEGAL WEIGHTS (*in pounds*) **PER BUSHEL—Continued**

State or Territory	Dried Peaches Peeled	Peanuts	Pears*	Peas: Green Peas Unshelled	Peas: Peas*	Potatoes	Sweet Potatoes	Redtop Seed	Rough Rice	Rutabagas	Rye Meal	Rye	Shorts*	Sorghum Seed	Tomatoes	Timothy Seed	Turnips	Wheat
Kentucky	39	24	....	....	60	60	55	....	....	....	....	56	....	....	....	45	60	60
Louisiana	....	....	....	....	....	....	....	....	....	....	....	32	....	....	....	....	....	60
Maine	....	....	....	....	60	60	....	....	....	60	50	50	....	....	....	....	50	60
Maryland	....	22	....	....	60	60	60	14	....	....	....	56	....	50	60	45	50	60
Massachusetts	33	20	58	....	60	60	54	....	45	....	50	56	20	....	56	45	55	60
Michigan	28	....	....	....	60	60	56	14	....	....	....	56	....	....	....	45	58	60
Minnesota	28	....	....	....	60	60	55	14	....	52	....	56	....	57	....	45	....	60
Mississippi	33	24	....	....	60	60	60	....	....	....	....	56	....	42	....	45	55	60
Missouri	33	....	48	56	60	60	56	14	....	50	....	56	....	42	45	45	42	60
Montana	....	....	45	....	60	60	....	....	....	....	....	56	....	....	....	45	50	60
Nebraska	33	....	....	....	60	60	50	....	....	....	....	56	....	50	....	45	55	60
Nevada	....	....	58	....	60	60	50	....	....	....	....	56	....	50	56	45	56	60
New Hampshire	....	20	....	....	60	60	54	....	....	....	50	56	20	....	56	45	55	60
New Jersey	33	....	....	....	60	60	54	....	....	....	....	56	....	....	....	45	....	60
New York	33	....	....	....	60	60	54	....	45	....	50	56	20	....	....	45	....	60
North Carolina	....	22	....	....	60	60	56	14	44	....	....	56	....	50	....	45	50	60
North Dakota	....	....	....	....	60	60	46	....	....	....	....	56	....	....	....	45	60	60
Ohio	33	....	....	....	60	60	50	....	....	....	....	56	....	....	56	45	60	60
Oklahoma	....	22	48	56	60	60	55	14	....	50	....	56	....	50	45	45	60	60
Oregon	28	....	45	....	....	60	....	....	....	....	....	56	....	....	....	....	....	60
Pennsylvania	....	....	....	....	....	56	....	....	....	....	....	56	....	....	....	....	....	60
Rhode Island	33	....	....	....	60	60	54	....	....	....	50	56	20	....	56	45	50	60
South Carolina	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
South Dakota	....	....	....	....	60	60	46	....	....	....	....	56	....	....	....	42	60	60
Tennessee	26	23	56	30	60	60	50	14	....	....	....	56	....	50	56	45	50	60
Texas	28	....	....	....	....	60	55	....	....	....	....	56	....	....	55	45	55	60
Vermont	....	....	....	....	60	60	....	....	....	....	....	56	....	....	....	45	60	60
Virginia	40	22	....	....	60	56	56	12	....	....	....	56	....	....	....	45	55	60
Washington	28	....	45	....	....	60	....	....	....	....	....	56	....	....	....	....	....	60
West Virginia	33	....	....	....	....	60	....	....	....	....	....	56	....	....	....	45	....	60
Wisconsin	33	....	....	....	60	60	54	....	45	56	50	56	20	....	....	45	42	60

* Not defined.
a Small white beans, 60 pounds.
b Green apples.
c Sugar beets and mango-wurzels.
d Shelled beans, 60 pounds; velvet beans, 78 pounds.
e White beans.
f Wheat bran.
g Corn in ear, 70 pounds until December 1st next after growth; 68 pounds thereafter.
h English blue-grass seed, 22 pounds; native blue-grass seed, 14 pounds.
i Rice corn.
j Corn in ear from November 1st to May 1st following, 70 pounds; 68 pounds from May 1st to November 1st.
k Soy beans, 58 pounds.
l Cracked corn, 50 pounds.
m Green unshelled beans, 30 pounds.
n Cannel coal, 70 pounds.
o Standard weight in borough of Greensburg, 75 pounds.
p Dried beans; gree n unshelled beans, 30 pounds.
q Red and white.
r Unwashed plastering hair, 8 pounds; washed plastering hair, 4 pounds.

Table II. LEGAL WEIGHTS PER BUSHEL FIXED IN BUT ONE OR TWO STATES

Article	Weight	States	Article	Weight	States
	Pounds			Pounds	
Blackberries	30	Iowa. Tennessee, 48 pounds; dried, 28 pounds.	Kale	30	Tennessee.
Blueberries	42	Minnesota.	Land plaster	100	Tennessee.
Canary seed	60	Tennessee.	Mustard	30	Tennessee.
Cantaloupe melon	50	Tennessee.	Plums	40	Florida. Tennessee, 64 pounds.
Cement	80	Tennessee.	Plums, dried	28	Michigan.
Cherries	40	Iowa. Tennessee, with stems 56 pounds; without stems, 64 pounds.	Popcorn	70	Iowa, Indiana, Tennessee. Ohio, in the ear, 42 pounds; Iowa, shelled, 56 pounds.
Chestnuts	50	Tennessee. Virginia, 57 pounds.	Prunes, dried	28	Idaho; green, 45 pounds.
Cotton seed, staple	42	South Carolina.	Quinces	48	Florida, Iowa and Tennessee.
Cucumbers	48	Iowa, Tennessee, Missouri. Wisconsin, 50 pounds.	Rape seed	50	Wisconsin.
Currants	40	Iowa and Minnesota.	Raspberries	32	Iowa, Kansas. Tennessee, 48 pounds.
Grapes	40	Iowa. Tennessee, with stems, 48 pounds; without stems, 60 pounds.	Rhubarb	50	Tennessee.
Hickory nuts	50	Tennessee.	Salads	30	Tennessee.
Hominy	60	Ohio. Tennessee, 62 pounds.	Sand	130	Iowa.
Horse-radish	50	Tennessee.	Spinach	30	Tennessee.
Kaffir corn	56	Kansas.	Strawberries	32	Iowa. Tennessee, 48 pounds.
			Sugar-cane seed	57	New Jersey.
			Velvet-grass seed	7	Tennessee.
			Walnuts	50	Tennessee, Iowa.

Apothecaries' Weight

Apothecaries' Weight is used by apothecaries and physicians weighing medicines for prescriptions.

TABLE

20 grains (gr.)	= 1 scruple (sc., or ℈)
2 scruples	= 1 dram (dr., or ʒ)
8 drams	= 1 ounce (oz., or ℥)
12 ounces	= 1 pound (lb., or ℔)

Pound		Ounces		Drams		Scruples		Grains
1	=	12	=	96	=	288	=	5760

1. In writing prescriptions, physicians express the number in Roman characters, using j instead of i final. They also write the symbol first; thus: ℥v, ʒvj, ℈ij.

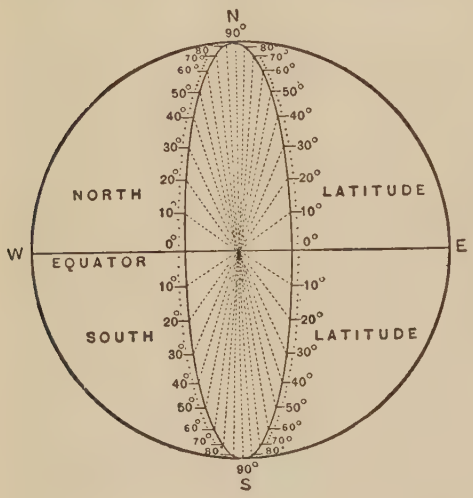
Medical Signs and Abbreviations

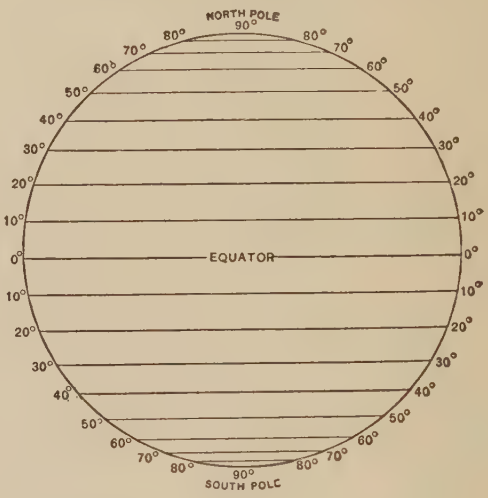
℞ (Lat. Recipe), take; āā, of each; ℔, pound; ℥, ounce; ʒ, drachm; ℈, scruple; ♏, minim, or drop; O or o, pint; f℥, fluid ounce; fʒ, fluid drachm; as, ℥ss, half an ounce; ℥i, one ounce; ℥ iss, one ounce and a half; ℥ij, two ounces; gr. grain; Q. S., as much as sufficient; Ft. Mist., let a mixture be made; Ft. Haust., let a draught be made; Ad., add to; Ad lib., at pleasure; Aq., water; M., mix; Mac., macerate; Pulv., powder; Pil., pill; Solv., dissolve, St., let it stand; Sum. to be taken; D., dose; Dil., dilute; Filt., filter; Lot., a wash; Garg., a gargle; Hor. Decub., at bed time; Inject., injection; Gtt., drops; ss, one-half; Ess., essence.

Comparison of Weights

TABLE

1 pound avoirdupois	=	7000 grains
1 ounce avoirdupois	=	437½ grains
1 pound Troy, or apothecary	=	5760 grains
1 ounce Troy, or apothecary	=	480 grains





CIRCULAR MEASURES

Circular or Angular Measures are used in surveying, navigation, astronomy, geography, reckoning latitude and longitude, and computing differences in time.

A *Circle* is a plane figure bounded by a curved line, every point of which is equally distant from a point within, called the center.

The *Circumference* is the bounding line of a circle.

The *Radius* of a circle is a straight line drawn from the circumference to the center.

The *Diameter* is a straight line drawn through the center, with the ends terminating in the circumference.

An *Arc* of a circle is any portion of the circumference.

An *Angle* is the difference in direction between two straight lines which meet.

If two diameters divide a circle into four equal parts, these diameters make *right angles* with each other.

An angle less than a right angle is an *acute angle.*

The circumference of a circle may be divided into 360 equal parts, called *degrees.* If the circle is large, the degree is large, and if the circle is small, the degree is small, but the degree is always $^1/_{360}$ part of the circumference, whatever the size of the circle.

An angle at the center of a circle is measured by the arc which bounds it.

If the angle is a right angle, it is measured by ¼ of 360 degrees, or 90 degrees; hence, any angle of 90 degrees is a right angle.

An acute angle is always less than 90 degrees.

An obtuse angle is always more than 90 degrees.

Table of Circular Measure

60 seconds (″) = 1 minute (′)
60 minutes = 1 degree (°)
360 degrees = 1 circumference (cir.)

Circumference		Degrees		Minutes		Seconds
1	=	360	=	21,600	=	1,296,000

A *quadrant* is ¼ of a circumference, or 90°; a *sextant* is ⅙ of a circumference, or 60°.

The length of a degree of longitude on the earth's surface at the Equator is 69.16 miles.

In astronomical calculation 30° are called a *sign*, and there are therefore 12 signs in a circle.

LONGITUDE AND TIME

The earth's circumference (which has the form of a circle) at the equator is (3.1416×7926), 24900 miles; which divided by 360, gives 69.17 miles for 1 degree of longitude at the equator. Leaving the equator, degrees of longitude gradually diminish, since all meridians converge at the poles. Thus, 1 degree of longitude, at 10 degrees of latitude, is 68.1 miles; at 20 degrees 65 miles; at 30 degrees 59.9 miles; at 40 degrees 53 miles; at 50 degrees 44.5 miles; at 60 degrees 34.6 miles; at 70 degrees 23.7 miles; at 80 degrees 12 miles; at 90 degrees 0.

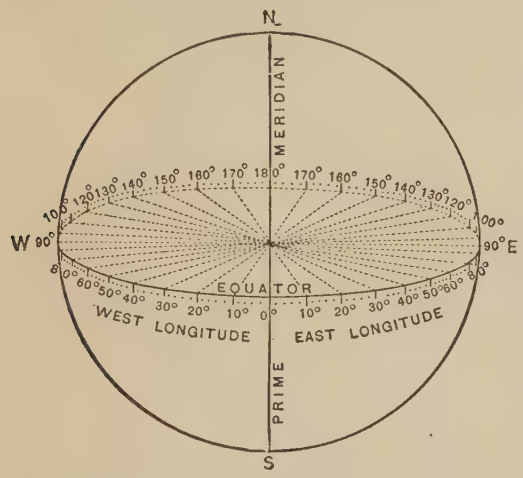
Imaginary lines running north and south, through these degrees, from pole to pole, are called *meridians.* Those east and west, *parallels.*

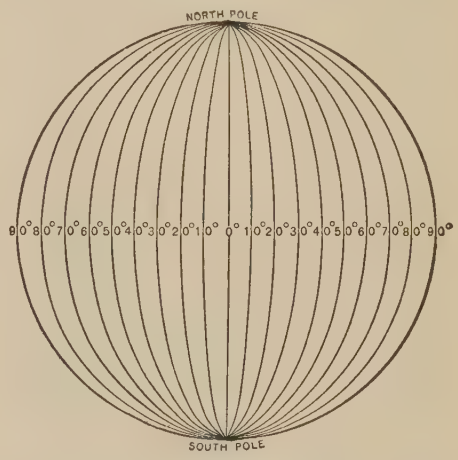
One meridian which runs through Greenwich, near London, England, is called the *prime meridian,* and all the other meridians are reckoned as east or west of it.

Longitude is distance east or west of the prime meridian. When we say that the longitude of

Paris is 2° 20′ East, we mean that the merdian running through Paris is 2° 20′ east of the prime meridian that runs through Greenwich, England. The longitude of Washington, D. C., is 77° 7′ West. That means that the meridian which passes through Washington is 77° 7′ west of the prime meridian.

The longitude of a place tells in degrees, minutes, and seconds, the distance it is east or west of the prime meridian.





RULE.—*To find the difference of time between two places, when the difference of longitude is known, or vice versa, multiply the given longitude, expressed in degrees, by 4. This gives the equivalent time in minutes. Dividing the given time, expressed in minutes, by 4, gives the equivalent longitude in degrees.*

EXAMPLE: The difference of longitude between Boston and San Francisco is nearly 51¼°, what is the difference of time?

51¼×4=205. 205 minutes equal 3 hours and 25 minutes. *Ans.* 3 hours and 25 minutes.

The difference of time between London and New York is about 4 hours and 55½ minutes, what is the difference of longitude?

4 hours and 55½ minutes equals 295½ minutes. 295½÷4=73⅞. *Ans.* 73⅞°.

MEASURES OF TIME

The unit of time measurement is the same among all nations. Practically it is 1-86400 of the mean solar day, but really it is a perfectly arbitrary unit, as the length of the mean solar day is not constant for any two periods of time. There is no constant natural unit of time.

Time measures are used in telling the time of day, in problems in longitude and time, in figuring interest on notes and bills, and in numerous other ways.

TABLE OF THE DIVISIONS OF TIME

60 seconds (sec.)	= 1 minute (min)
60 minutes	= 1 hour (hr.)
24 hours	= 1 day (da.)
7 days	= 1 week (wk.)
30 days	= 1 commercial month (mo.)
52 weeks	= 1 year (yr.)
12 months	= 1 year
360 days	= 1 commercial year
365 days	= 1 common year
366 days	= 1 leap year
100 years	= 1 century

Century	Years	Months	Days	Hours	Minutes
1 =	100 =	1,200 =	36,500 =	876,000 =	52,560,000

Centennial years exactly divisible by 400, and other years exactly divisible by 4, are *Leap Years.*

WHY WE HAVE LEAP YEAR

The average time it takes the earth to revolve once around the sun (*one* year) is 365 days, 5 hours, 48 minutes, 47.8 seconds, or *about* 365¼ days.

The change in the length of the mean sidereal day, *i. e.*, of the time of the earth's rotation upon its axis, amounts to 0.01252 seconds in 2400 mean solar years.

Instead of reckoning this part of a day each year, it is disregarded, and an addition is made when this amounts to one day, which is very nearly every fourth year. This addition of one day is made to the month of February. Since the part of a day that is disregarded when 365 days are considered as a year, is a little less than one quarter of a day, the addition of one day every fourth year is a little too much, and, to correct this excess, addition is made to only every fourth centennial year.

STANDARD TIME

By this is meant time which differs from Greenwich mean time by whole hours.

The earth revolves on its axis from west to east, nearly 17.3 miles in 1 minute at the equator; at the latitude of New Orleans, nearly 15 miles in 1 minute; at Memphis, 14 miles; at Chicago, 13 miles; at London, 10.8 miles; at St. Petersburg, 8.6 miles. That is, a watch would gain one minute going west, or lose one minute going east that distance, in the latitudes of the respective cities.

The globe is divided into zones of 15 degrees or one hour breadth, the Greenwich meridian being in the center of the zero zone. Thus Belgium and Holland (since 1892) keep Greenwich time; Denmark, Sweden, Switzerland (1894), Austrian railroads, Germany, and Italy (1893) keep the time of longitude 15 degrees East—*i.e.* one hour earlier than Greenwich. In North America again five zones are distinguished. The corresponding times are distinguished as Eastern (67½ to 82½ degrees), Central (82½ to 97½ degrees), Mountain (97½ to 112½ degrees), and Pacific (112½ to 127½ degrees) times.

New York people are in the Eastern Time Belt. If they rise at six o'clock in the morning,

The clock at Greenwich, near London, England, from which the standard time of the world is reckoned.

they will be up a whole hour before Chicago people, who get up at the same hour.

Thus, each day begins an hour sooner in New York than in Chicago, two hours before Denver, and three hours before San Francisco.

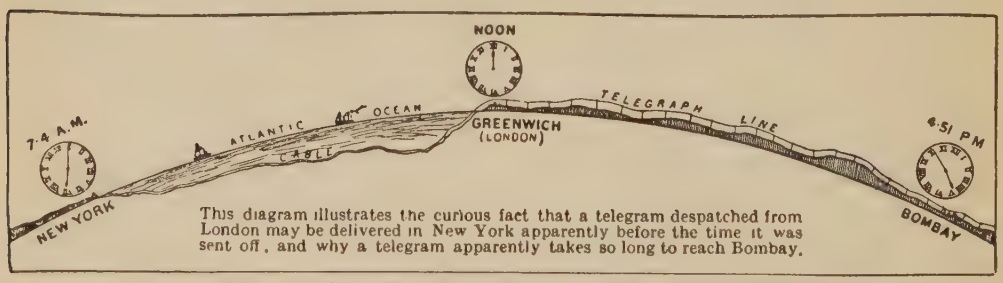
Standard time in Japan is nine hours earlier than Greenwich time.

In the western parts of Canada the twenty-four hour system has been adopted, under which four P. M. becomes sixteen o'clock and so on. Steps are being taken to introduce it generally in India, Belgium, and the United States. It is of special convenience in the construction of railroad time tables; and it has long been used by the Italians and by astronomers.

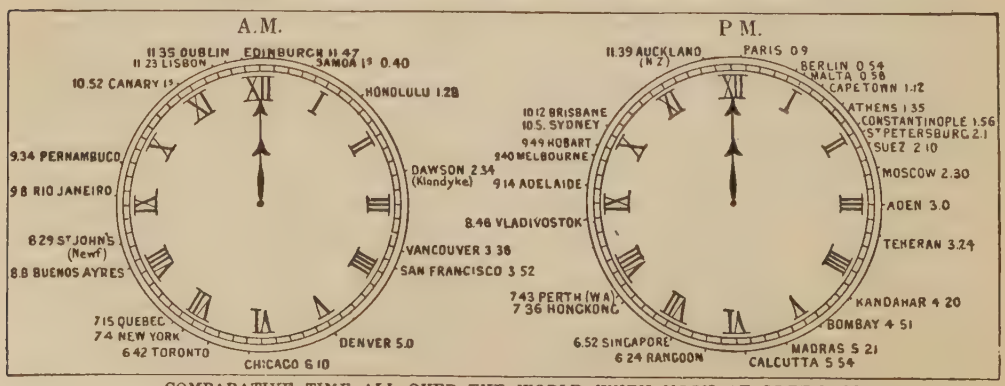
THE CALENDAR

The reckoning of time among the ancients was very inaccurate. This was owning to their ignorance of astronomy, and also to changes that were made from time to time for political reasons. The calendar was reformed by Julius Cæsar, 46 B. C., who made the year consist of 365¼ days, adding one day every fourth year. In 1582, the error in the calendar established by him had increased to 10 days; that is, too much time had been reckoned as a year, until the civil year was 10 days behind the solar year. To correct this error, Pope Gregory XIII. decreed that 10 days should be stricken from the calendar, that the day following the 3d day of October, 1582, should be made the 14th, and that henceforth only those centennial years should be leap years which are divisible by 400.

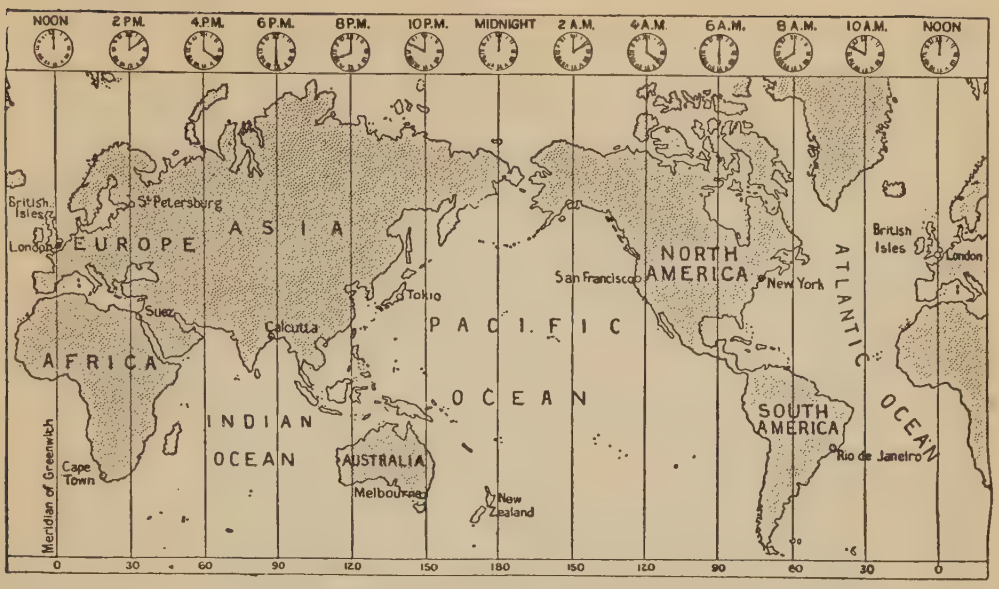
Most Catholic countries adopted the Gregorian Calendar soon after it was established. Great Britain did not adopt it until 1752, when the error amounted to 11 days. By Act of Parliament, the 3d of September was called the



SIMULTANEOUS TIME IN LONDON, NEW YORK, AND BOMBAY



COMPARATIVE TIME ALL OVER THE WORLD WHEN NOON AT GREENWICH



THE COMPARATIVE TIME ZONES OF THE WORLD

14th. The civil year by the same act was made to commence on the 1st of January, instead of the 25th of March, as was previously the case.

Dates reckoned by the Julian calendar are called Old Style (O.S.), and those reckoned by the Gregorian calendar are called New Style (N.S.). The difference now amounts to 12 days.

Perpetual Calendar

To find the day of the week for any given date.

1. Take the last two figures of the year, add one-fourth of them (neglecting remainder). Thus: $1949 = 49 + 12 = 61$.

2. Add for the month, if for January or October, 1; May, 2; August, 3; February, March, or November, 4; June, 5; September or December, 6; April or July, 0; if leap year (that is, if it be divisible by 4 without remainder) January 0; February 3.

3. Add day of month.

Divide the sum of these three by 7, and remainder gives the number of the day of the week.

Thus:—What day of the week is 15th July, 1908?

1. $8 + 2 = 10$
2. July $= 0$
3. 15th $= 15$

$$25 = 7 \times 3 + 4$$

4th day of the week = Wednesday.

What day of the week was December 25th, 1905?

1. $5 + 1 = 6$
2. Dec. $= 6$
3. 25th $= 25$

$$37 = 7 \times 5 + 2$$

2nd day of the week = Monday.

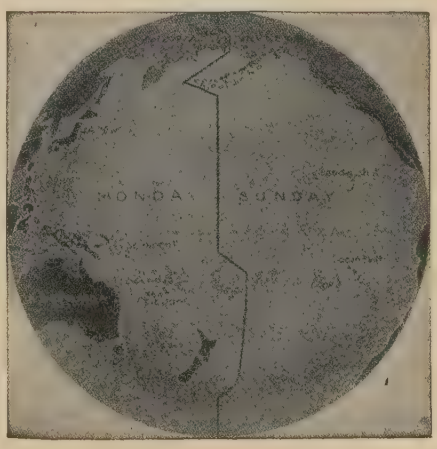
The above only applies to 20th Century. For 19th Century, add 2; for 21st Century, add 6; 18th Century, 4; but before 1752 the "old style" was used.

WHERE THE DAY BEGINS

The day begins earlier as you go east until you meet the 180th meridian. This is where the day begins. Starting here, it travels westward, giving the whole world a new day. The 180th meridian is called the *International Date Line* (*I. D. L.*) but in reality, the date line is a crooked line which zigzags across the 180th meridian.

From the time the day starts at the International Date Line, until the sun again reaches that line, the same day is in progress the world over.

As marked now, the International Date Line passes southward through Behring Sea, then westerly, then returns to the 180th meridian at about 40 degrees north. It then follows the 180th meridian to 10 degrees south, where it swerves east but returns again to the 180th meridian at about 50 degrees south. It then follows that meridian.



Time on Shipboard.—The twenty-four hours are divided on board ship into seven parts, and the crew is divided into two parts or watches, designated port and starboard watches. Each watch is on duty four hours, except from four to eight p. m., which time is divided into two watches of two hours each, called dog watches, by means of which the watches are changed every day, and each watch gets a term of eight hours' rest at night. First watch, eight p. m. to midnight; middle watch, midnight to four a. m.; morning watch, four to eight a. m.; forenoon watch, eight a. m. to noon; afternoon watch, noon to four p. m.; first dog watch, four to six p. m.; second dog watch, six to eight p. m. The bell is struck every half-hour to indicate the time, as follows:

1 bell.....	12:30 A.M.	1 bell.....	12:30 P.M.
2 bells.....	1:00 A.M.	2 bells.....	1:00 P.M.
3 bells.....	1:30 A.M.	3 bells.....	1:30 P.M.
4 bells.....	2:00 A.M.	4 bells.....	2:00 P.M.
5 bells.....	2:30 A.M.	5 bells.....	2:30 P.M.
6 bells.....	3:00 A.M.	6 bells.....	3:00 P.M.
7 bells.....	3:30 A.M.	7 bells.....	3:30 P.M.
8 bells.....	4:00 A.M.	8 bells.....	4:00 P.M.
1 bell.....	4:30 A.M.	1 bell.....	4:30 P.M.
2 bells.....	5:00 A.M.	2 bells.....	5:00 P.M.
3 bells.....	5:30 A.M.	3 bells.....	5:30 P.M.
4 bells.....	6:00 A.M.	4 bells.....	6:00 P.M.
5 bells.....	6:30 A.M.	1 bell.....	6:30 P.M.
6 bells.....	7:00 A.M.	2 bells.....	7:00 P.M.
7 bells.....	7:30 A.M.	3 bells.....	7:30 P.M.
8 bells.....	8:00 A.M.	4 bells.....	8:00 P.M.
1 bell.....	8:30 A.M.	1 bell.....	8:30 P.M.
2 bells.....	9:00 A.M.	2 bells.....	9:00 P.M.
3 bells.....	9:30 A.M.	3 bells.....	9:30 P.M.
4 bells.....	10:00 A.M.	4 bells.....	10:00 P.M.
5 bells.....	10:30 A.M.	5 bells.....	10:30 P.M.
6 bells.....	11:00 A.M.	6 bells.....	11:00 P.M.
7 bells.....	11:30 A.M.	7 bells.....	11:30 P.M.
8 bells.....	12:00 noon	8 bells.....	12:00 night

HOW THE MONTHS GOT THEIR NAMES

January, from Janus, was the sacred month of the year to the Romans. To them, Janus was the god of the year. During the 18th century, the Europeans started to recognize it as the first month, but previous to this, March was considered the first.

February comes from februa, the name of a Roman festival celebrated on the 15th of the second month.

March is from Mars, the god of war. March was the first month of the year to the Romans.

April, from the Latin *aperire*, "to open," was probably so called because during this month buds begin to open.

May is from Maia, the mother of Mercury. The Romans offered sacrifices to this goddess on the first day of May.

The sixth month in our calendar, June, got its name from Juno, the wife of Jupiter.

July was so named in honor of Julius Cæsar, who was born in this month.

Emperor Augustus Cæsar commanded that the eighth month be named August after him.

September is from the Latin septem, meaning seven. At the time when March was the first month of the year, September was the seventh.

October, November, and December were originally the eighth, ninth and tenth months. *Octo, novem*, and *decem* are Latin numerals for eighth, ninth, and tenth.

HOW THE DAYS GOT THEIR NAMES

Sunday (that is, day of the sun, like Monday day of the moon), the first day of the week, the Lord's day, was sacred to Sol or the Sun.

Monday (that is, moon-day; Anglo-Saxon, *Monandæg;* German, *Montag*), the second day of our week, was formerly sacred to the moon.

Tuesday, the third day of the week, is so called from *Tiwesdæg*, the day of Tiw or Tiu, the old Saxon name for the god of war. The day bears a corresponding name in the other Germanic dialects.

Wednesday, the fourth day of the week, the *Dies Mercurii* of the Romans, the *Mittwoch* of the modern Germans. The name Wednesday is derived from the Northern mythology, and signifies Woden's or Odin's day. The Anglo-Saxon form was *Wôdanesday*, the Old German *Woutanestac*. The Swedish and Danish is *Onsdag*.

Thursday, (Swedish *Thorsdag*, German *Donnerstag*), the fifth day of the week, is so called from Donar, or Thor (see Dictionary of Myths), who, as god of the air, had much in common with the Roman Jupiter, to whom the same day was dedicated. (Latin *Jovis dies*, French *Jeudi*).

Friday, the sixth day of the week, from the Anglo-Saxon *Frige-dæg*, is the day sacred to *Frigga* or to *Freya*, the Saxon Venus.

Saturday (Anglo-Saxon *Sæterdæg*, *Sæterndæg* —*Sæter*, *Sætern*, for Saturn, and *dæg*, a day— the day presided over by the planet Saturn), is the seventh or last day of the week; the day of the Jewish Sabbath.

MEASURES OF VALUE

The common measure of value is *Money*.

It is also called Currency, and is of two kinds, viz.: coin and paper money.

Stamped pieces of metal having a value fixed by law are *Coin or Specie*.

Notes and bills issued by the government and banks, and authorized to be used as money, are *Paper Money*.

All moneys which, if offered, legally satisfy a debt are a *Legal Tender*.

UNITED STATES MONEY

The unit of United States or Federal money is the Dollar.

The dollar mark is probably a combination of U. S., the initials of the words "United States."

The standard of United States money is the gold dollar. Gold is used because in itself it has great worth and little bulk, and because it varies very little in value.

Names of United States Coins

Bronze:		*Nickel:*	
One-cent piece		Five-cent piece	
Silver:		*Gold:*	
Dollar	=$1.00	Double eagle	=$20.00
Half-dollar	= 0.50	Eagle	= 10.00
Quarter-dollar	= 0.25	Half eagle	= 5.00
Dime	= 0.10	Quarter eagle	= 2.50

It may be interesting to know that the word *dollar* is supposed to have come from *Dale*, the name of a small town where dollars were first coined.

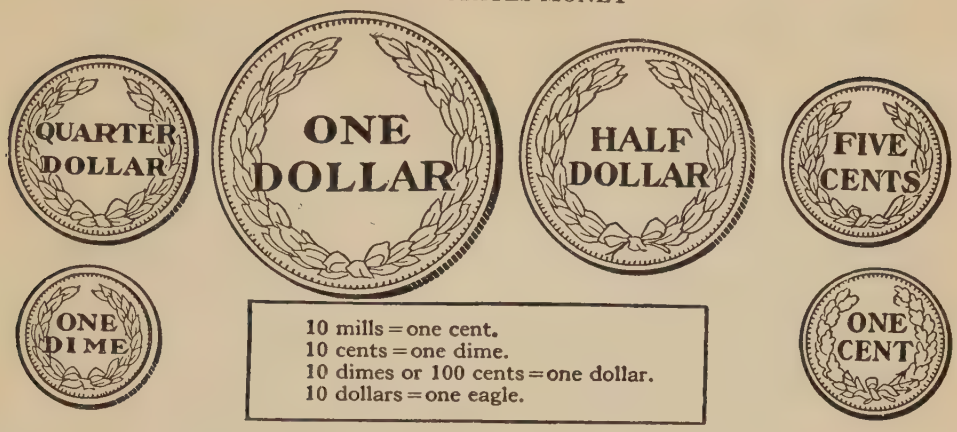
Dime is from the French word *disme*, which means tenth.

Cent comes from the Latin word *centum*, meaning hundred.

Mill is also from the Latin, coming from *mille*, a thousand.

Eagles were named after our national bird.

UNITED STATES MONEY



10 mills = one cent.
10 cents = one dime.
10 dimes or 100 cents = one dollar.
10 dollars = one eagle.

Weights of the United States Coins And the Amounts for Which They are Legal Tender

GOLD

Denominations	Weight Grains	Amount for Which a Legal Tender
Double eagle, $20.....	516.	Gold coins of denomination are legal tenders for any amount.
Eagle, $10.....	258.	
Half eagle, $5.....	129.	
Three dollars.....	77.4	
Quarter eagle, $2.50...	64.5	
Dollars.....	25.8	

SILVER

Denominations	Weight Grains	Amount for Which a Legal Tender
Standard dollar.....	412.5	Unlimited.
Trade Dollar.....	420.	Demonetized—Not a legal tender.
Half dollars.....	192.9	Ten dollars.
Quarter dollars.....	96.45	Ten dollars.
Twenty-cent pieces...	77.16	Five dollars.
Dimes.....	38.58	Ten dollars.
Half-dimes.....	19.29	Five dollars.
Three-cent pieces.....	11.52	Five dollars.

MINOR COINS

Denominations	Weight Grains	Amount for Which a Legal Tender
Five cents.....	77.6	Twenty-five cents.
Three cents.....	30.	Twenty-five cents.
Two cents.....	96.	Twenty-five cents.
Cents.....	48.	Twenty-five cents.

Besides the coins there is paper money, founded on credit. It represents value, but in itself has no value.

This paper money is made up of paper promises to pay the amounts named, in gold or silver, on demand.

It includes bank bills, United States treasury notes, government bonds, etc. They represent the values $1, $2, $5, $10, $20, $50, $100, $500, $1,000 and $10,000.

Notation of United States Money

Dollars and cents are written together. Thus, two dollars and sixteen cents is written, $2.16.

The dollars are separated from the cents by a period. If the number of cents is less than ten, the tens' place is filled by a 0. Thus, we write twenty dollars and two cents, $20.02.

Mills, or tenths of a cent, are written to the right of the cents. Five dollars, six cents, four mills is written, $5.064.

Note.—The rules and processes of decimals apply to the addition, subtraction, multiplication, and division of United States money.

ENGLISH OR STERLING MONEY

Sterling Money is currency of Great Britain and Ireland.

Table of Sterling Money

4 farthings (far.)	= 1 penny (d.)
12 pence (not pennies)	= 1 shilling (s.)
20 shillings	= 1 pound (£), or sovereign
5 shillings	= 1 crown
21 shillings	= 1 guinea

The standard unit of Sterling Money is 1 pound or sovereign, whose value in our money is $4.8665.

The coins of Great Britain in general use are :—

Gold: Sovereign, half-sovereign, and guinea, which is equal to 21 shillings.

Silver: The crown (equal to 5 shillings), half-crown, florin (equal to 2 shillings), shilling, six-penny and three-penny pieces.

Copper: Penny and half-penny.

Example: I have £5 sterling. What is the value in United States money?

Solution:
The value is 5 × $4.8665, or $24.33.

FRENCH MONEY

In France the currency is decimal. The unit is the *Franc.*

TABLE

10 centimes (ct.)	[pronounced *son-teems*]	= 1 decime (dc.)
10 decimes	[pronounced *des-seems*]	= 1 franc (fr.)

Scale.—Decimal

The value of the franc, as determined by the Secretary of the Treasury, is $.193 in United States money.

The coins of France are of gold, silver, bronze, and copper. The gold coins are the *hundred, forty, twenty, ten,* and *five* franc pieces; the silver coins are the *five, two,* and *one* franc pieces; also the *fifty* and *twenty-five* centime pieces. The bronze coins are the *ten, five, two,* and *one* centime pieces. There are also copper coins in *ten* and *five* centime pieces.

Example: When in France, I bought goods as follows:—

3 books at 2 francs,
½ dozen pipes at 1 franc,
2 pictures at 4 francs.

What was the cost in United States money?

WORK:

3 books at 2 francs cost.....6 francs
½ dozen pipes at 1 franc cost....6 francs
2 pictures at 4 francs cost.....8 francs

Cost of all.....20 francs
20 francs =20×19.3 cents, or $3.86

GERMAN MONEY

German money is legal currency of the German Empire.

TABLE

100 pfennigs = 1 mark

Scale.—Decimal

1. The unit is the *mark*. Its value is $.2385 in United States money.

2. The coins of the German Empire are of gold, silver, nickel, and copper. The gold coins are the 20-mark piece, the 10-mark piece, and the 5-mark piece. The silver coins are the *two* and *one* mark pieces; the nickel coins are the *ten* and *five* pfennig pieces; and the copper coins are the *two* and *one* pfennig pieces.

PHILIPPINES WEIGHTS AND MEASURES

1 pulgada (12 linea)	=	.927 inch
1 pie	=	11.125 inches
1 vara	=	33.375 inches
1 gantah	=	.8796 gallon
1 caban	=	21.991 gallons
1 libra (16 onzo)	=	1.0144 pounds average
1 arroba	=	25.360 pounds average
1 catty (16 tael)	=	1.394 pounds average
1 pecul (100 catty)	=	139.482 pounds average

PAPER MEASURE

24 sheets	=	1 quire (qr.)
20 quires	=	1 ream (rm.)
2 reams	=	1 bundle
5 bundles	=	1 bale

Although a ream contains 480 sheets, 500 sheets are usually sold as a ream.

NUMBER TABLE

12 units	=	1 dozen
12 dozen	=	1 gross
12 gross	=	1 great gross
20 units	=	1 score

PERCENTAGE AND ITS BUSINESS APPLICATIONS

The expression "per cent," which is an abbreviation of the Latin words "per centum," means "for each hundred."

The symbol % is often used to denote "per cent." Thus, 7 per cent, or 7%, means 7 parts out of every 100 parts, *i. e.*, $^7/_{100}$ of the whole.

Since per cent means hundredths, we may write any fraction whose denominator is 100 as so many per cent. In some cases the corresponding common fractions are so simple that it is advisable to remember them. For example:

$$25\% = \frac{25}{100} = \frac{1}{4}, \qquad 50\% = \frac{50}{100} = \frac{1}{2},$$

$$75\% = \frac{75}{100} = \frac{3}{4}, \qquad 33\tfrac{1}{3}\% = \frac{33\tfrac{1}{3}}{100} = \tfrac{1}{3},$$

$$66\tfrac{2}{3}\% = \frac{66\tfrac{2}{3}}{100} = \frac{2}{3}, \qquad 5\% = \frac{5}{100} = \frac{1}{20},$$

$$2\tfrac{1}{2}\% = \frac{2\tfrac{1}{2}}{100} = \frac{1}{40}, \qquad 12\tfrac{1}{2}\% = \frac{12\tfrac{1}{2}}{100} = \frac{1}{8},$$

and so on.

The *number* per cent is called the *rate* per cent.

TABLE OF ADDITIONAL VALUES

Symbol		Decimal		Common Fraction		
1%	=	.01	=	$^1/_{100}$		
2%	=	.02	=	$^2/_{100}$	=	$^1/_{50}$
3%	=	.03	=	$^3/_{100}$		
4%	=	.04	=	$^4/_{100}$	=	$^1/_{25}$
5%	=	.05	=	$^5/_{100}$	=	$^1/_{20}$
6%	=	.06	=	$^6/_{100}$	=	$^3/_{50}$
7%	=	.07	=	$^7/_{100}$		
8%	=	.08	=	$^8/_{100}$	=	$^2/_{25}$
9%	=	.09	=	$^9/_{100}$		
10%	=	.10	=	$^{10}/_{100}$	=	$^1/_{10}$
20%	=	.20	=	$^{20}/_{100}$	=	$^1/_5$
25%	=	.25	=	$^{25}/_{100}$	=	$^1/_4$
50%	=	.50	=	$^{50}/_{100}$	=	$^1/_2$
100%	=	1.00	=	$^{100}/_{100}$	=	1

Here are a few others that should be learned:—

6¼%	=	⅛ of 100%	16⅔%	=	⅙ of 100%
8⅓%	=	$^1/_{12}$ of 100%	33⅓%	=	⅓ of 100%
12½%	=	⅛ of 100%	66⅔%	=	⅔ of 100%

A DECIMAL AS PER CENT

Write the decimal as hundredths, and the number expressing the number of hundredths is the per cent.

EXAMPLES:

$$.4 = .40 = \frac{40}{100} = 40\%$$

$$.8 = .80 = \frac{80}{100} = 80\%$$

$$.25 = \frac{25}{100} = 25\%$$

$$.33\tfrac{1}{3} = \frac{33\tfrac{1}{3}}{100} = 33\tfrac{1}{3}\%$$

$$.50 = \frac{50}{100} = 50\%$$

$$.87\tfrac{1}{2} = \frac{87\tfrac{1}{2}}{100} = 87\tfrac{1}{2}\%$$

If the decimal has more than two decimal places, the figures after the second one are written as a fraction of a per cent, as,—

$$.255 = \frac{25\tfrac{1}{2}}{100} = 25\tfrac{1}{2}\%.$$

$$.163 = \frac{16\tfrac{3}{10}}{100} = 16\tfrac{3}{10}\%.$$

To change a common fraction to per cent:

1. *Change the fraction to a decimal.*
2. *Express the decimal as hundredths.*
3. *The result is the per cent desired.*

EXAMPLES:

½	= .5	= .50	=	50%
¾	= .75	=		75%
⅔	= .66⅔	=		66⅔%
$^9/_{10}$	= .90	=		90%
$^8/_9$	= .88$^8/_9$	=		88$^8/_9$%
$^7/_8$	= .87½	=		87½%
$^{25}/_{26}$	= .96$^2/_{13}$	=		96$^2/_{13}$%

Or, they may be written this way:

$$\tfrac{3}{4} = \tfrac{3}{4} \text{ of } \frac{100}{100} = \frac{75}{100} = 75\%$$

$$\tfrac{2}{3} = \tfrac{2}{3} \text{ of } \frac{100}{100} = \frac{66\tfrac{2}{3}}{100} = 66\tfrac{2}{3}\%$$

$$\tfrac{1}{2} = \tfrac{1}{2} \text{ of } \frac{100}{100} = \frac{50}{100} = 50\%$$

TERMS USED IN PERCENTAGE

In *Percentage*, there are five terms or quantities considered; namely, the *Base*, *Rate per cent*, *Percentage*, *Amount* and *Proceeds* or *Difference;* any two being given, a third one may be found.

The base and rate given, to find the percentage.

RULE.—*Multiply the base by the rate per cent expressed decimally.*

EXAMPLE: How many dollars is 6% of $50?

$50, the *Base*, or number on which percentage is computed.
.06, the *Rate*, or term denoting number of hundredths taken.
$3.00, the *Percentage*, or the product of the base and rate per cent.
$53.00, the *Amount*, or the base increased by the percentage.
$47.00, the *Proceeds*, or *Difference*, the base less the percentage.
Ans. $3.00.

When the rate per cent is an aliquot part of 100, the percentage is readily found by taking such a part of the base as the rate per cent is part of 100. Thus, at 10%, take $^1/_{10}$ of base; at 12½%, $^1/_8$; at 16$^2/_3$%, $^1/_6$, etc.

The base and percentage given, to find the rate.

RULE.—*Divide the percentage by 1% of the base.*

EXAMPLE: Bought a watch for $15 and sold it for $18; what per cent did I make?

.15)3.00
20
Ans. 20%

Here, $15.00 is the base, and ($18 − $15) $3.00, the gain or percentage. Now, as 1% of 15.00 is .15, it is evident that 3.00 is as many per cent of 15.00, as .15 is contained times is 3.00, which is 20.

Proof: 20% or ⅕ of $15 = $3.

The percentage and rate given, to find the base.

RULE.—*Divide the percentage by the rate per cent expressed decimally.*

EXAMPLE: Received $6.40, percentage or interest, for money loaned at 4%, what was the base or principal?

.04)6.40
Ans. $160

If $1 produces .04 (4 cents) in a certain time, $6.40 must be the percentage of as many dollars as .04 is contained times in $6.40, which is 160.

Proof: 4% of $160 (160 × .04) = $6.40.

The amount and rate given, to find the base.

RULE.—*Divide the given amount by 1.00 plus the rate per cent.*

EXAMPLE: Bought a horse at a certain price, and sold him for $84, making 12% on cost; what did he cost?

1.12)84.00
Ans. $75

If I made 12% on cost, every dollar invested gained 12 cents; hence, the horse cost as many dollars as 1.12 is contained times in 84.00, which is 75.

Proof: 12% of $75 (75 × .12) = $9; $75 + $9 = $84.

The proceeds and the rate given, to find the base.

RULE.—*Divide the given proceeds by 1.00 minus the rate per cent.*

EXAMPLE: Sold a wagon for $51, which is 40% less than it cost; what did it cost?

.60)51.00
Ans. $85

If I lost 40%, or 40 cents on the dollar, I received only 60 cents for every dollar the wagon cost; hence, it cost as many dollars as .60 is contained times in 51.00, which is 85.

Proof: 40% of $85 (85 × .40) = $34; $85 − $34 = $51.

NOTE.—The principles of percentage, in one form or another, enter into nearly all commercial calculations, besides many others. It is therefore of the utmost importance to business men, clerks, accountants, bookkeepers, and others, to become expert in percentage, and to adopt the easiest, simplest and shortest methods in computing interest, partial payments, trade discount, profit and loss, commission, insurance, stocks, bonds, taxes, exchange, etc.

PROFIT AND LOSS

When a thing is sold for more than it cost the seller, it is said to be sold at a profit. If it is sold for less than the cost, it is sold at a loss. Hence,

Profit = Selling Price − Cost Price.
Loss = Cost Price − Selling Price.

A profit or loss is generally reckoned as a percentage.

It is always understood that the percentage is reckoned on the cost price.

EXAMPLE: I buy wheat at 60 cents and sell it for 75 cents. What per cent do I gain?

SOLUTION: I gain the difference betwen 75 cents and 60 cents, or 15 cents. 15 cents is 25% of the cost. Heuce, I gain 25%.

WORK:
75 cents − 60 cents = 15 cents.
15 cents ÷ 60 cents = .25, or 25%.

EXAMPLE: I bought flour at $3.50 per barrel. For what must I sell it to gain 20%?

SOLUTION: I must sell it for 100% of the cost plus 20% of the cost, or 120% of the cost.

120% of $3.50 = $4.20.
∴ I must sell it at $4.20.

EXAMPLE: I sold my carriage for 80% of its cost and received $90 for it. What was the cost?

SOLUTION:
1% of the cost is $^1/_{80}$ of $90, or $1.125.
100% of the cost = 100 × $1.125, or $112.50.

COMMISSION

is a percentage paid for buying or selling real estate, goods, etc. A consignment is a quantity of goods, sent to an agent, broker or commission merchant, for sale. The consignor is the one who sends the goods, the consignee the one to whom they are sent.

PRINCIPLES:

1. *The commission is some number or per cent of the price of what is bought or sold.*
2. *The proceeds equal the selling price minus the commission.*
3. *The amount equals the selling price plus the commission.*

Commission presents two classes of problems. One of these classes may be called "buying problems." The other may be called "selling problems."

BUYING PROBLEM: I sent my agent $1977.60 to *buy* wild farm lands in northern Wisconsin, at $3 per acre. He was to receive 3% for his work. How many acres did he buy?

WORK AND EXPLANATION:
3% of $3 = $.09.
Cost to me of 1 acre is $3 + $.09 = $3.09

For $1977.60 he buys as many acres as $3.09 is contained times in $1977.60, or 640. Hence, he buys 640 acres.

SELLING PROBLEM: My agent *sells* 360 pounds of butter for me at 20 cents. He pays $4.20 freight charges and $9.60 for storage. His commission is 5%. What does he send me?

WORK AND EXPLANATION:

360 pounds at 20 cents =	$72.00
Freight is $4.20	
Storage is 9.60	
Commission is 5% of $72, or 3.60	
Total charges =	17.40

He sends me the difference, or $54.60

TRADE DISCOUNT

is an allowance made by manufacturers and jobbers from their list or marking prices. When the market varies, they change the discount accordingly, or make several discounts instead of changing the list.

Trade discount is a certain per cent off, or from list or marking price; while profit and loss is computed on the cost or purchase price.

The amount of the discount allowed depends sometimes upon the amount of order, and sometimes upon the terms of settlement. Very often two or more discounts are deducted in succession. Thus, 10% and 5% off; or, as it is gener-

ally expressed in business, 10 and 5 off, means a discount of 10%, and then 5% from what is left; 20, 10, and 5 off, means three successive discounts. A retailer's profit is smaller when he is allowed 10 and 5 off, than if he were allowed 15 off. The result is not affected by the order in which the discounts are taken.

EXAMPLE: I receive a bill of goods amounting to $100, 20% off. What is the net cost?

FIRST WAY:	SECOND WAY:
20% of $100 = $20	100% − 20% = 80%
$100 − $20 = $80	80% of $100 = $80

EXAMPLE: A merchant receives two bills of $200 each. On one there is a discount of 25%; on the other, 15% and 10%. What must he pay on each, net?

FIRST BILL:	SECOND BILL:
100% − 25% = 75%,	100% − 15% = 85%
or ¾	100% − 10% = 90%
¾ of $200 = $150.	90% of 85% = 76.5%
	.765 × $200 = $153.

PROMISSORY NOTES

A *note* is a written promise to pay a specified sum at a certain time.

The person who promises is called the *maker*, and the person to whom he promises is called the *payee*.

The *face* of a note is the sum of money promised.

A *negotiable note* is one which is made payable to the bearer, or to the order of the payee. A negotiable note can be sold or transferred.

A note is *non-negotiable* when it is payable only to the person or persons named in the note.

An *indorser* of a note is a person who writes his name on the back of it. The person who indorses, by so doing guarantees its payment. An *indorsement in blank* is simply the signature of the indorser written across the back of the note or draft. When indorsed in this way the note or draft is made payable without further indorsement to any person holding.

A note or draft is *indorsed in full* when the indorser states, over his signature, the person to whose order the note or draft is to be paid. If an indorser does not wish to guarantee the payment of a note or draft, he writes "Without recourse" over his name when indorsing it.

A *protest* of a negotiable note or draft is a formal statement by a notary public that said note or draft was presented for payment or acceptance and refused.

A note, when due, must be presented at the place at which it is made payable. The *day of maturity* is the day on which a note becomes due.

The *days of grace* are the three days beyond the specified time for payment. Days of grace are now practically abolished throughout the United States.

KINDS OF NOTES.—There are three principal kinds of notes—*Time Notes*, *Joint Notes*, and *Joint and Several Notes*.

A *Time Note* must be paid in a specified time.

A *Joint Note* is one signed by two or more persons who are jointly liable for its payment.

A *Joint and Several Note* is a note signed by two or more persons who are both jointly and individually liable for its payment. Each man who signs the note is as much responsible for the payment of the whole sum as if he had signed alone.

LEGAL RULES THAT APPLY TO NOTES

A note made out on *Sunday* is void.

If a note does not state that *interest* is to be paid, it does not bear interest until after it is due.

If anyone obtains a note *by fraud* or from an *intoxicated person*, he cannot collect.

To be negotiable an instrument must be in writing and signed by the maker (of a note) or drawer (of a bill or check).

It must contain an unconditional promise or order to pay a certain sum in money.

Must be payable on demand, or at a fixed future time.

Must be payable to order or to bearer.

In a bill of exchange (check), the party directed to pay must be reasonably certain.

Every negotiable instrument is presumed to have been issued for a valuable consideration, and want of consideration in the creation of the instrument is not a defense against a bona-fide holder.

An instrument is negotiated, that is completely transferred, so as to vest title in the purchaser, if payable to bearer, or indorsed simply with the name of the last holder, by mere delivery; if payable to order, by the indorsement of the party to whom it is payable and delivery.

One who transfers an instrument by indorsement warrants to every subsequent holder that the instrument is genuine, that he has title to it, and that if not paid by the party primarily liable at maturity, he will pay it upon receiving due notice of non-payment.

To hold an indorser liable the holder upon its non-payment at maturity must give prompt notice of such non-payment to the indorser and that the holder looks to the indorser for payment. Such notice should be sent within twenty-four hours.

When an indorser is thus compelled to pay he may hold prior parties, through whom he received the instrument, liable to him by sending them prompt notice of non-payment upon receiving such notice from the holder.

One who transfers a negotiable instrument by delivery, without indorsing it, simply warrants that the instrument is genuine, that he has title to it, and knows of no defense to it, but does not agree to pay it if unpaid at maturity.

The maker of a note is liable to pay it, if unpaid at maturity, without any notice from the holder or indorser.

Notice to one of several partners is sufficient notice to all.

When a check is certified by a bank the bank becomes primarily liable to pay it without notice of its non-payment, and when the holder of a check thus obtains its certification by the bank, the drawer of the check and previous indorsers are released from liability, and the holder looks to the bank for payment.

A bona-fide holder of a negotiable instrument, that is, a party who takes an instrument regular on its face, before its maturity, pays value for it and has no knowledge of any defenses to it, is entitled to hold the party primarily liable responsible for its payment, despite any defenses he may have against the party to whom he gave it, except such as rendered the instrument void in its inception. Thus, if the maker of a note received no value for it, or was induced to issue it through fraud or imposition, that does not defeat the right of a bona-fide holder to compel its payment from him.

The dates and amounts of *partial payments* on a note, before it is finally paid in full, are placed on the back.

The *place of payment*, if not mentioned, is at the maker's place of business or residence, during reasonable business hours.

If a *note* or a *check* received in payment of a debt is *dishonored*, the debt revives.

Ignorance of the law does not excuse anyone. No *contract* is good unless there be a *consideration*. No consideration is good that is *illegal*.

The *maker* of an *accommodation note* is not bound to the person accommodated; but he is bound to any other person receiving the note for value.

BANK DISCOUNT

The sum charged by a *bank* for cashing a note or time draft is called *bank discount*. This discount is the simple interest, paid in advance, for the number of days the note has to run. Wholesale business houses usually sell goods on *time* and take notes from the retailers in payment. These notes are not often for a longer period than *three months*. Some are placed in the banks for collection, others are *discounted*. When a note is discounted at a bank the payee *indorses* it, making it payable to the bank. Both maker and payee are then responsible to the bank for its payment. If the note is drawing interest the discount is reckoned on and deducted from the amount due at maturity. Most notes discounted at banks do not draw interest. The *time* in bank discount is always the number of days from the date of discounting to the date of maturity.

EXAMPLE: A note of $250, dated July 7, payable in 60 days, is discounted July 7 at 6%; find the proceeds.

EXPLANATION: This note is due in 63 days, or September 8. The accurate interest of $250 for 63 days at 6% is $2.59. The proceeds, then, will be $250 − $2.59, or $247.41.

The *Present Worth* of a note or debt is a sum, which, if put at interest, will amount to that debt in the given time.

The *True Discount* is the difference between the debt at maturity and its present worth.

REMEMBER:

1. *To allow three days of grace, if the debt discounted is a note.*

2. *To add the interest due at maturity to the principal, before discounting, if the note bears interest.*

EXAMPLES: Case I.—Note not bearing interest.

What is the present worth and true discount on a note of $200, if paid 6 months before due, the discount being 6%.

SOLUTION: Amount of $1 for 6 months at 6% = $1.03. If $1.03 = amount of $1, $200 is the amount of as many dollars as $^{200}/_{1.03}$, or $194.17 +.

$194.17 is the present worth. $200 − $194.17 = $5.83 true discount.

The following rule can be deduced from the foregoing solution:—

RULE: 1. *To find the present worth, divide the debt by the amount of $1 for the given time.*

2. *To find the true discount, subtract the present worth from the debt.*

Case II.—Note bearing interest.

What is the present worth of a note of $300. bearing 6% interest, due in 2 years 4 months, if money is worth 10%.

SOLUTION: Interest on $300 for 2 years 4 months at 6% = $42.

$300 + $42 = $342. Amount due at maturity.

Amount of $1 for 2 years 4 months at 10% = $1.23⅓.

If $1.23⅓ = amount of $1, then $3.42 is the amount of $$\frac{342}{1.23\frac{1}{3}}$$, or $277.29.

$277.29 = present worth.

INTEREST

If a person borrows money, he usually pays something for the loan.

The sum of money he borrows is called the *Principal;* the money he pays for the use of the principal is called *Interest*. Interest is generally reckoned at so much for the use of each $100 for one year. This amount is called the *Rate per cent per Annum.*

Thus, if we say that $200 is borrowed for three years at 4 per cent per annum, we mean that the borrower, at the end of each year, pays the lender $4 for each $100 borrowed—*i.e.*, $8 interest for each year.

In the above example the interest is supposed to be paid to the lender at the end of each year. Interest thus reckoned is called *Simple Interest.*

The sum obtained by adding the interest for any given time to the principal is called the *Amount* in that time.

COMMON INTEREST METHODS

If we were to find the interest on a sum of money for 3 years 4 months 5 days, we would find the interest for 1 year, then for 1 month ($^1/_{12}$ of a year), then for 1 day ($^1/_{360}$ of a year). Having the interest for 1 year 1 month 1 day, it is a simple matter of multiplication to get it for 3 years 4 months 5 days.

EXAMPLE:

What is the interest on $520 for 1 year 3 months at 6%?

WORK:

1 year 3 months = 1¼ year
$520 principal
.06

4)$31.20 interest 1 year

$7.80 interest ¼ year

$39.00 interest 1¼ year

THE 60-DAY INTEREST METHOD

In what is called the 60-Day Method, 360 days are considered one year, and 30 days one month. Upon this basis the interest for 60 days, or two months, at any rate, will be $^1/_6$ of the interest for one year; and when the rate is 6% the interest for 60 days is one per cent or $^1/_{100}$ of the principal. Thus, the interest of $247 for 60 days at 6% is $2.47.

EXAMPLE: Find the interest of $1728 for 80 days at 6%.

WORK:

$17	28	= interest for 60 days.
5	76	= interest for 20 days.
$23	04	= interest for 80 days.

EXPLANATION: The interest of $1728 for 60 days at 6% is 1% of $1728, or $17.28; and the interest for 20 days (⅓ of 60) is ⅓ of $17.28, or $5.76. Hence for 80 days it will be $17.28 plus $5.76, or $23.04.

METHODS OF RECKONING TIME

The Common Method.—When the time is long, generally 30 days are considered a month.

The Exact Method.—When the time is short, the exact number of days is generally counted but we sometimes find the exact number of days also when the time is long.

The Bankers' Method.—Bankers get the exact number of days between two dates, but each day is reckoned as $^1/_{360}$ of a year.

PROBLEM, when the time is long.

Find the time between April 12, 1895, and September 22, 1899.

BEST METHOD

From April 12, 1895, to April 12, 1899, is 4 *years*.
From April 12, 1899, to Sept. 12, 1899, is 5 *months*.
From Sept. 12, 1899, to Sept. 22, 1899, is 10 *days*.
Time between dates = 4 years 5 months 10 days.

ANOTHER METHOD

1899	9	22
1895	4	12
4	5	10

PROBLEM, when the time is short.

Find the difference in time between April 12 and July 15, 1902.

WORK:

Number of days left in April =18
in May =31
in June =30
in July =15

Total number of days =94

NOTE.—If the rate and principal are given, it is a simple matter to find the interest, now that we have the time.

Example of the use of Table: What is the time from February 10 to October 18, in the same year. February 10 is numbered 41, and October 18 is numbered 291; 291 − 41 = 250, *Ans.* This includes the last day, but not the first. If both days are taken, subtract 40 from 291 = 251, *Ans.* When February 29 occurs in a term, count an additional day. The day of the date of a note is not included in its term; thus, required the last day of grace of a note dated March 24, at 90 days. March 24 = 83; 83 + 93 = 176 = June 25, *Ans.*

COMPOUND INTEREST

Interest computed, at regular intervals, on the sum of the principal and any unpaid interest, is called *compound interest.* In other words, as soon as interest becomes due and is unpaid, it begins to draw interest at the same rate as the principal. Compound interest is generally paid on the deposits in savings banks and is used in calculating amortization and sinking funds.

Interest may be compounded quarterly, semi-annually, annually, or at the end of any other period agreed upon. In some States the collection of compound interest is not permitted.

EXAMPLE: Find the amount and the compound interest of $1200 at 6% for two years, interest compounded semi-annually.

SOLUTION:

$1200.00	First principal
36.	Interest for 6 months
1236.	Principal at beginning of second 6 months
37.08	Interest for second 6 months
1273.08	Principal at beginning of third period
38.19	Interest for third period
1311.27	Principal at beginning of fourth period
39.34	Interest for fourth period
$1350.61	Amount at end of two years
$1350.61	Amount at end of two years
1200.00	Principal
$ 150.61	Compound interest.

EXCHANGE

in commerce is a method of making payments in distant places, without the actual

TABLE OF TIME, IN DAYS

The following table gives the exact time, in days, between two dates.

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	32	60	91	121	152	182	213	244	274	305	335
2	33	61	92	122	153	183	214	245	275	306	336
3	34	62	93	123	154	184	215	246	276	307	337
4	35	63	94	124	155	185	216	247	277	308	338
5	36	64	95	125	156	186	217	248	278	309	339
6	37	65	96	126	157	187	218	249	279	310	340
7	38	66	97	127	158	188	219	250	280	311	341
8	39	67	98	128	159	189	220	251	281	312	342
9	40	68	99	129	160	190	221	252	282	313	343
10	41	69	100	130	161	191	222	253	283	314	344
11	42	70	101	131	162	192	223	254	284	315	345
12	43	71	102	132	163	193	224	255	285	316	346
13	44	72	103	133	164	194	225	256	286	317	347
14	45	73	104	134	165	195	226	257	287	318	348
15	46	74	105	135	166	196	227	258	288	319	349
16	47	75	106	136	167	197	228	259	289	320	350
17	48	76	107	137	168	198	229	260	290	321	351
18	49	77	108	138	169	199	230	261	291	322	352
19	50	78	109	139	170	200	231	262	292	323	353
20	51	79	110	140	171	201	232	263	293	324	354
21	52	80	111	141	172	202	233	264	294	325	355
22	53	81	112	142	173	203	234	265	295	326	356
23	54	82	113	143	174	204	235	266	296	327	357
24	55	83	114	144	175	205	236	267	297	328	358
25	56	84	115	145	176	206	237	268	298	329	359
26	57	85	116	146	177	207	238	269	299	330	360
27	58	86	117	147	178	208	239	270	300	331	361
28	59	87	118	148	179	209	240	271	301	332	362
29	—	88	119	149	180	210	241	272	302	333	363
30	—	89	120	150	181	211	242	273	303	334	364
31	—	90	—	151	—	212	243	—	304	—	365

transmission of money, but by a Bill of Exchange called *Draft*, which is a written request upon one person to pay a certain sum to another or to his order. The person who orders the money to be paid, is called the *Drawer;* the one who is directed to pay it, the *Drawee*, and the one to whom it is directed to be paid, the *Payee*.

Domestic or *Inland Exchange* is exchange between places in the same country: *Foreign Exchange*, between different countries.

If, for every little business transaction, money had to be sent from one business center to another, much needless inconvenience and expense would be incurred.

A man in Chicago owes a man in New York City a sum of money. He can send it to him in one of five ways:—

1. By Check.
2. By Post-office Order
3. By Express Order
4. By Bill of Exchange
5. By Telegraph

Suppose Mr. White of Chicago owes Mr. Brown of Boston $200 for groceries and Mr. Allen of Boston owes Mr. Warner of Chicago $200 for rent. Wouldn't it save expense and trouble if Mr. White should go to Mr. Warner and Mr. Allen to Mr. Brown? Thereby two debts are cancelled by two city transactions and no money need be sent from one city to another.

This is all there is to Exchange, only in business life banks instead of individuals transact the business.

Only a small percentage of the money really passes from one city to another.

Exchange in the United States is carried on mostly by banks located in the large cities, which charge a small fee for transacting the business.

If the drawee accepts the draft, he writes

TABLE OF COMMERCIAL LAW IN THE STATES

Interest Laws			Statutes of Limitation			Exemption Laws	
Legal Rate Per Cent	Per Cent Allowed by Contract and Penalty for Usury		Judgments	Notes	Open Accounts	Personal Property, Exempt	Homestead, Exempt
Alabama	8;	Forfeit interest	20 yrs.	6 yrs.	3 yrs.	$1,000	$2,000
Arizona	6	12; No provision	4 yrs.	4 yrs.	3 yrs.	500	2,500
Arkansas	6	10; Forfeit principal and interest	10 yrs.	5 yrs.	3 yrs.	500	2,500
California	7	Any; No provision	5 yrs.	4 yrs.	4 yrs.	.....	5,000
Colorado	8	Any; No provision	6 yrs.	6 yrs.	6 yrs.	.....	2,000
Connecticut	6	15; Fine or imprisonment, or both.	7 yrs.	6 yrs.	6 yrs.	.....	1,000
Delaware	6	6; Principal and interest forfeited	10 yrs.	6 yrs.	3 yrs.	200	.....
Dist. of Col.	6	6; Forfeit interest	12 yrs.	3 yrs.	3 yrs.	300	.....
Florida	8	10; Forfeit interest	20 yrs.	5 yrs.	3 yrs.	1,000	160 acres
Georgia	7	8; Forfeit excess of interest	7 yrs.	6 yrs.	4 yrs.	300	1,600
Idaho	7	12; Forfeit interest and 10% of principal	6 yrs.	5 yrs.	4 yrs.	.....	5,000
Illinois	5	7; Forfeit interest	20 yrs.	10 yrs.	5 yrs.	400	1,000
Indiana	6	8; Excess interest forfeited	20 yrs.	10 yrs.	6 yrs.	600	or 600
Iowa	6	8; Forfeit interest and 8% of principal	20 yrs.	10 yrs.	5 yrs.	200	or 40 acres
Kansas	6	10; Forfeit of double amount of usurious interest	5 yrs.	5 yrs.	3 yrs.	.....	160 acres
Kentucky	6	6; Forfeit of interest	15 yrs.	15 yrs.	5 yrs.	250	1,000
Louisiana	5	8; Forfeit interest	10 yrs.	5 yrs.	3 yrs.	.....	Total, 2,000
Maine	6	Any; No provision	20 yrs.	20 yrs.	6 yrs.	.....	500
Maryland	6	6; Forfeit interest	12 yrs.	3 yrs.	3 yrs.	100	.....
Massachusetts	6	Any; No provision	20 yrs.	6 yrs.	6 yrs.	.....	800
Michigan	5	7; Forfeit interest	6 and 10	6 yrs.	6 yrs.	500	1,500
Minnesota	6	10; Forfeit interest	10 yrs.	6 yrs.	6 yrs.	500	80 acres
Mississippi	6	10; Forfeit interest	7 yrs.	6 yrs.	3 yrs.	.....	2,000
Missouri	6	8; Forfeiture or misdemeanor	10 yrs.	10 yrs.	5 yrs.	300	1,500(min.)
Montana	8	Any; No provision	10 yrs.	8 yrs.	5 yrs.	.....	2,500
Nebraska	7	10; Forfeit interest	5 yrs.	5 yrs.	4 yrs.	500	or 2,000
Nevada	7	Any; No provision	6 yrs.	6 yrs.	4 yrs.	.....	5,000
New Hampshire	6	6; Forfeit three times excess	20 yrs.	6 yrs.	6 yrs.	.....	500
New Jersey	6	6; Forfeit interest and costs	20 yrs.	6 yrs.	6 yrs.	200	1,000
New Mexico	6	12; Forfeit of twice the amount of interest	7 yrs.	6 yrs.	4 yrs.	500	1,000
New York	6	6; Forfeit of principal and interest; misdemeanor	20 yrs.	6 yrs.	6 yrs.	250	1,000
North Carolina	6	6; Forfeit interest	10 yrs.	3 yrs.	3 yrs.	500	1,000
North Dakota	7	12; Forfeit interest	10 yrs.	6 yrs.	6 yrs.	1,000	5,000
Ohio	6	8; Forfeit interest over 6%	5 yrs.	15 yrs.	6 yrs.	100	1,000
Oklahoma	6	10; Forfeit interest	5 yrs.	5 yrs.	3 yrs.	.....	5,000
Oregon	6	10; Forfeit principal and interest	10 yrs.	6 yrs.	6 yrs.	.....	1,500
Pennsylvania	6	6; Forfeit excess of interest	20 yrs.	6 yrs.	6 yrs.	300	.....
Rhode Island	6	Any; No provision	20 yrs.	6 yrs.	6 yrs.	500	.....
South Carolina	7	8; Forfeit interest	20 yrs.	6 yrs.	6 yrs.	500	1,000
South Dakota	7	12; Misdemeanor	20 yrs.	6 yrs.	6 yrs.	750	5,000
Tennessee	6	6; Forfeit of excess interest	10 yrs.	6 yrs.	6 yrs.	.....	1,000
Texas	6	10; Forfeit interest	10 yrs.	4 yrs.	2 yrs.	500	5,000
Utah	8	12; Forfeit excess interest	8 yrs.	6 yrs.	4 yrs.	.....	2,000
Vermont	6	6; Forfeit of excess interest	8 yrs.	6 yrs.	6 yrs.	200	500
Virginia	6	6; Forfeit interest	20 yrs.	5 yrs.	2 yrs.	.....	2,000
Washington	6	12; Forfeit of double accrued interest and costs	6 yrs.	6 yrs.	3 yrs.	1,000	2,000
West Virginia	6	6; Forfeit excess interest	10 yrs.	10 yrs.	5 yrs.	200	1,000
Wisconsin	6	10; Forfeit treble amount of usurious interest paid	20 yrs.	6 yrs.	6 yrs.	200	5,000
Wyoming	8	12; Forfeit interest	5 yrs.	5 yrs.	8 yrs.	500	1,500

NOTE.—In many of the States it is impossible to place a fixed amount on personal property exempt. In the table above these states have no amount given in the personal property column. Days of grace have been abolished in all states except the following: Arkansas, Mississippi, South Carolina and Texas.

across the face of it "*Accepted*" with the date and his signature. This is called an *Acceptance*.

Once accepted, the draft becomes a note, with the same laws regulating it. If the draft is not accepted, it is not binding and we say that it has been "*dishonored*."

A bill of exchange is entitled to days of grace, if it is payable in a State where grace is allowed, unless a particular day is named in the draft. In most States, no grace is allowed on sight drafts.

Principles of Exchange

To find the cost of a draft, the face and rate per cent of exchange being given.

Rule.—*Find the percentage of the given rate per cent of exchange and add it to, or subtract it from the amount of draft.*

Example: What is the cost, in Chicago, of a sight draft on Denver for $400, if exchange is ¾% premium; and how much if ½% discount?

$400 × .00¾ = $3; $400 + $3 = $403, at ¾% premium.
$400 × .00½ = $2; $400 − $2 = $398, at ½% discount.

To find the face of a draft, cost and rate per cent of exchange given.

Rule.—*Divide by the cost of a draft for $1, at given rate per cent of exchange.*

Example: Find face of draft that can be bought for $1000 at 1% premium; at 1% discount.

$1000 ÷ 1.01 = $990.10, at 1% premium.
$1000 ÷ .99 = $1010.10, at 1% discount.

Time Drafts, when negotiated before maturity, are subject to discount which is computed on the face of the draft, the same as interest.

Example: What is the proceeds of a 60-day draft for $800, at ⅝% premium, and discounted at 7%?

$805.00, face + ⅝% premium
9.33, interest (7%, 60 days)

$795.67, proceeds. *Ans.*

Foreign Drafts are usually made payable in the money of the country on which they are drawn.

To find the equivalent of foreign money in United States money and vice versa.

Rule.—*Multiply, or divide (as the case may require) the given sum, by the equivalent of a unit in United States money.*

Example: What is the cost of a draft on London for £125, reckoning exchange at $4.8665?

125 × 4.8665 = 608.31. *Ans.* $608.31.

Wishing to remit $182.50 to Ireland, for what amount must I buy a draft on London?

182.50 ÷ 4.8665 = 37.5. *Ans.* £37½.

How many francs in $100?
100.000 ÷ .193 = 518.13. *Ans.* 518.13 francs.

How many dollars in 7500 German marks?
7500 × .238 = $1785, *Ans.*

How many Swedish crowns in $750?
750 ÷ .268 = 2798½ crowns, *Ans.*

How many dollars in 4635 rubles?
4635 × .772 = $3578.32, *Ans.*

A simple method to reduce pounds sterling to United States money, and vice versa; exchange being at $4.8665.

Rule.—*Multiply pounds sterling by 73, and divide the product by 15. Or multiply dollars by 15 and divide the product by 73.*

Examples: How many dollars in £85?
$85 \times {}^{73}/_{15} = 413.67$. *Ans.* $413.67.

How many £'s in $748.25?
$748.25 \times {}^{15}/_{73} = 153\frac{3}{4}$. *Ans.* £153¾.

Another method to change pounds sterling, shillings and pence, to dollars and cents.

Rule.—*Reduce pounds sterling to shillings, add the shillings, and multiply the sum by .24⅓—the product will be cents. Add 2 cents for each pence, if any.*

Example: Change £46, 13s. 9d. to United States money.

46 × 20 = 920	933 × .24⅓ = 227.03
13	9d. = .18
933	*Ans.* $227.21

Tourists of today patronize express companies for *Foreign Money Orders*. These are made out similar to regular express money orders and may be cashed in any of the larger cities of all foreign countries. They take the place, to a large extent, of *Letters of Credit*, which are letters from banking houses in one country to those in another, allowing sums to be drawn not to exceed a total named in the letter.

STOCKS AND BONDS

Stocks is a general name given to the capital of incorporated companies. They are divided into equal parts, usually of $100 each, called *Shares*, the owners of which are called *Stockholders*. A *Dividend* is a part of the net income of the company, divided among the stockholders.

A *certificate of stock* is a written paper signed by the proper officers of the corporation, naming the number of shares to which the person named therein is entitled, and the original value of the same.

Preferred stock is stock which is given a preference over the common stock. Ordinarily, a dividend is paid on the preferred stock before any is paid on the common shares.

Common stock is the ordinary stock of a corporation, which has no preference, in the payment of dividends, over any other.

The *par value* of a share of stock is the value named in the certificate of stock.

When a corporation is prosperous, its shares of stock often sell for more than the value named in the certificate of stock. They are then said to be *above par*, or *at a premium*. In times of business depression, often these shares of stock sell below their face value. They are then said to be *below par*, or *at a discount*.

The *market value* of a share of stock is the value for which it sells in the open market.

A *stock broker* is one who makes a business of buying and selling stocks and bonds. He charges a commission for this which is called *brokerage*.

A *surplus* is a part of the earnings of a corporation.

The *gross earnings* of a corporation are its total receipts from all sources.

The *net earnings* are the profits remaining when all expenses, losses, interest and debts due are paid.

An *assessment* is a sum levied proportionate to stock held by stockholders, to help out the business when it is not prospering, or when more money is needed to carry it on. It is levied as so many dollars on each share at its par value.

The *directors* are those shareholders elected by all to manage the affairs of the corporation.

A *bond* is, in form, a carefully drawn interest-bearing promissory note. Ordinarily, it runs for a period of years with interest often payable semi-annually. It is more formal than the ordinary promissory note. Bonds are usually

issued by national, state, county, or local governments, or by corporations, when they wish to raise large sums of money for immediate use.

DIFFERENCE BETWEEN STOCKS AND BONDS

A bond runs for a specified time. It bears a specified interest, and is an absolute promise to pay the face of it at maturity. It matures at a definite time, and at that time the holder is paid it *face value* and no more, by the organization that issued it, unless such organization is insolvent, or has repudiated its debts.

Stocks.—A certificate of stock is no promise to pay. It simply shows that the holder owns as much stock in the corporation as is shown by the face of the certificate. It bears no interest and has no date of maturity.

The interest returns of the bondholder are certain and definite. The returns of the stockholder, dividends, are uncertain and depend on the profits of the business.

Consequently, no table can be arranged to show at what rate stocks can be bought to yield a definite return; but with bonds, tables may be made which show at a glance what the return will be from a purchase made at any rate.

APPLICATION OF PERCENTAGE TO STOCKS

1. To find the value of stocks, when above or below par.

RULE.—*Multiply the price per share, by the number of shares.*

EXAMPLE: Find cost of 65 shares of bank stock, at $107 per share, or 7% premium. Also of 48 shares of railroad stock, at $87½ per share, or 12½% discount.

(1) $65 \times 107 = 6955$. *Ans.* $6955.
(2) $48 \times 87\frac{1}{2} = 4200$. *Ans.* $4200.

2. To find what rate per cent is realized by investing in stocks or bonds when above or below par.

RULE.—*Annex two ciphers to the fixed rate per cent, and divide by the cost per share.* Or by proportion: *As the cost per share is to the fixed rate, so is 100 to the required rate.*

EXAMPLE: Mr. Warren bought ten shares of Illinois Central Railroad stock at 96. What does he get when a dividend of 6% is declared? What per cent is that on his investment?

WORK AND EXPLANATION:

(1) 1 share at 6% yields $6
10 shares yield $10 \times \$6 = \$60$.
(2) Each share at 96 costs $96.
Each share yields $6.
Query? $6 is what per cent of $96?
$6 is $^6/_{96}$ of 100%, or 6¼%.
∴ the investment yields 6¼%.

3. To find which is the more profitable investment.

RULE.—*Find the rate per cent that each investment yields, by rule, under item 2; then compare rates.*

EXAMPLE: Which is the better investment; 6% mortgages at 10% premium, or 5% bonds at 10% discount?

(1) $110)600(5^5/_{11}\%$.
(2) $90)500(5^5/_9\%$. $^5/_9 - {}^5/_{11} = {}^{10}/_{99}$, practically $^1/_{10}$.
Ans. The latter, by $^1/_{10}$ of 1%, nearly.

TAXES AND TAXATION

A *tax* is a contribution levied on persons, property, incomes, or business, for public purposes.

SOME USES FOR TAXES.—The *National Government* requires money to support the army and navy, to pay the salaries of government employes, to pay pensions, and to finance other activities carried on by the nation.

The *State Governments* require money for the expense of their officers, and to support their various institutions, schools, universities, asylums, and penitentiaries.

The *counties* require money for the building of bridges, the trial of criminal cases, the salaries of officers, the relief of the poor, etc.

Cities must pay for police and fire protection, care of streets, etc.

School districts contribute to the support of the public schools.

The money required for all these expenses is raised by taxes, licenses, fees, assessments, and fines.

STATE AND LOCAL TAXES.—The amount of tax paid by any individual to state and local governments depends upon the value of the property which he owns and the tax rate. In many places the adult male citizen pays a poll tax.

The tax levied on property is called a *property tax.*

The tax levied on persons is called a *poll tax.* This is cometimes called a *capitation* (by the head) *tax.*

Sometimes a man's income is taxed. This is an *income tax.*

After the amount of money to be raised by tax is decided upon, a man, called the *assessor,* examines each piece of taxable personal property and real estate, and places a value upon it. This is taken as a basis for proportioning the tax among the property owners.

A *tax collector* is one who collects the taxes. He is sometimes paid a salary. Sometimes he gets only a percentage of the money he collects.

The *treasurer* receives and takes care of the money collected by the tax collector. He is paid a salary.

THE TAX RATE.—Sometimes the rate is fixed by law or by vote of the citizens. More often the lump sum to be raised is named, and the assessor determines the rate.

When the assessor is to determine the rate, he proceeds in this way: First, he assesses each piece of property, usually not at its full market value. Then he determines the total value of all the property in his district. Next, he divides the total tax to be raised by the total value of the property in his district. The result is the *rate of tax* on the dollar.

USE OF THE MILL IN TAXES.—When a tax is apportioned, it is usually found that if a few mills are paid on each dollar's worth of property in the district, the aggregate amount is equal to the whole sum of tax needed. Consequently, we often hear of tax levies of so many *mills* on the *dollar,* as, 2 mills on the dollar, 5 mills on the dollar, etc.

The denomination of our money system called the *mill* has practically its only use in the levy of taxes.

Assessors make use of a table like the one given on the following page. This table is based on a tax levy of 9 mills on the dollar.

The following tax rates are equivalent:

16 mills (on the dollar);
1.6%;
$1.60 (on each hundred dollars).

EXPLANATION OF TABLE. The second column shows the tax at nine mills on the dollar, for values of $1 to $30.

The fourth column shows the tax for values of $40 and multiples of ten, to $600. The sixth column shows the tax for values of $700 and multiples of one hundred, to $10,000.

TAX TABLE

PROPERTY VALUE	TAX	PROPERTY VALUE	TAX	PROPERTY VALUE	TAX
$ 1	$0.009	$ 40	$0.36	$ 700	$ 6.30
2	0.018	50	0.45	800	7.20
3	0.027	60	0.54	900	8.10
4	0.036	70	0.63	1,000	9.00
5	0.045	80	0.72	2,000	18.00
6	0.054	90	0.81	3,000	27.00
7	0.063	100	0.90	4,000	36.00
8	0.072	200	1.80	5,000	45.00
9	0.081	300	2.70	6,000	54.00
10	0.09	400	3.60	7,000	63.00
20	0.18	500	4.50	8,000	72.00
30	0.27	600	5.40	9,000	81.00

THE AMOUNT OF TAX.—To find the amount of tax to be paid by any property owner.

RULE.—*Multiply the assessed value of the property by the tax rate.*

EXAMPLE: Taylor's property is assessed at $3800. The rate is 24 mills.

SOLUTION: $3800 assessed valuation
.024 tax rate in mills

$91.20 tax.

EXAMPLE: The town of Grant is to raise $4725 in tax. The property in the town has an assessed valuation of $395,140. What is the rate?

If on $395,140 a tax of $4725 is to be raised, on $1 as much tax must be raised as $395,140 is contained times in $4725, which is .0119+, or about $.0119. This would be called $0.012, or 12 mills on the dollar.

EXAMPLE: Finch's property is assessed at $5470. The tax rate is $1.95.

SOLUTION:
$1.95 the rate per hundred dollars
54.70 the number of hundreds of dollars assessed value

$106.67 the tax.

INDIRECT TAXES are taxes placed upon goods by the national government, and collected before the goods are sold to the consumer.

The national government needs this money to pay:—

1. Interest on the public debt.
2. To support an army and navy, to build vessels, and keep up arsenals and forts.
3. To pay pensions.
4. To improve the rivers and harbors.
5. To pay the salaries of its officers; as, the president, cabinet officers, judges, ministers to foreign countries, congressmen, etc.

Indirect taxes are of two kinds, *customs* or *duties*, and *excises* or *internal revenue*.

Excises or *internal revenue* are taxes levied on certain domestic goods, as, manufactured tobacco, liquors, and the like.

Indirect taxes levied by the government on imported goods or merchandise are called *duties* or *customs*.

A *custom house* is a government office where duties are collected and where vessels are entered and cleared. Nearly every seaport of consequence has a custom house. So also have important towns near the Canadian and Mexican boundaries.

Duties are of two kinds, *specific* and *ad valorem*.

A *specific* duty is one levied at a specified sum per yard, gallon, ton, etc.

An *ad valorem* duty is one levied at a certain percentage of the value of the goods, at the port of export.

Tare is an allowance made for the weight of bags, barrels, or cases, in which merchandise is shipped.

Leakage is an allowance made for loss of liquids from casks, barrels, etc., in shipping.

Breakage is an allowance made for the loss of liquids from bottles in shipping.

EXAMPLE: Find the duty on 4 dozen bottles of cologne, allowing 4% for leakage and 3% for tare. The invoice value is 90 cents a bottle and the duty is 25% ad valorem and 20 cents specific. Find the total cost per bottle.

WORK AND EXPLANATION:

Leakage and tare are 4% + 3% = 7%.
4 dozen bottles = 48 bottles.

The invoice value of 48 bottles is 48 × 90 cents = $43.20
Tare and leakage are 7% of $43.20 = $ 3.024

Value on which duty is paid.....$40.176

Ad valorem duty is 25% of $40.176 = $10.044
Specific duty is 48 × 20 cents = 9.60

Total duty.....$19.644

The total cost is
Invoice value.....$43.20
Ad valorem duty..... 10.04
Specific duty..... 9.60

$62.84

The total cost per bottle is 1/48 of $62.84, or $1.31 —.

SQUARE ROOT AND CUBE ROOT

POWERS AND ROOTS.—When a product consists of the same factor repeated any number of times it is called a *power* of that factor.

7×7 is the *second power*, or the *square* of 7.

$7 \times 7 \times 7$ is the *third power*, or the *cube* of 7.

A power of a number is generally expressed by writing the number only once, and placing after it, above the line, a small figure to show how many factors are to be taken. The small figure is called an *index*.

Thus, $7^2 = 49$; $7^3 = 343$; $7^4 = 2401$.

A number is called the *square root* of its square.

Since $7^2 = 49$, the square root of 49 is 7.

The "square root of 49" is written $\sqrt{49}$.

Again, a number is called the *cube root* of its cube. $7^3 = 343$. Therefore, the cube root of 343 is 7.

The "cube root of 343" is written $\sqrt[3]{343}$.

A *perfect square* is a number whose square root is a whole number. A *perfect cube* is a number whose cube root is a whole number.

SQUARE ROOT.—If a number can be put into prime factors, its square root can be written down by inspection.

EXAMPLE: Find the square root of 27225.

Since $27225 = 3^2 \times 5^2 \times 11^2$.
$\therefore \sqrt{27225} = 3 \times 5 \times 11 = 165$ *Ans.*

RULE FOR DIGITS.—We know that $\sqrt{1} = 1$, and $\sqrt{100} = 10$. Therefore, the square root of any number which lies between 1 and 100 lies between 1 and 10; *i.e.*, if a number contains one or two digits, its square root consists of one digit.

Similarly, since $\sqrt{100} = 10$ and $\sqrt{10000} = 100$, the square root of a number between 100 and 10000 lies between 10 and 100. That is, if a number contains three or four digits, its square root consists of two digits.

Proceeding in this way, we obtain a general result—viz., the square of a number has either twice as many digits as the number, or one less than twice as many.

Hence, to ascertain the number of digits in the square root of a perfect square, mark off the

digits in pairs, beginning from the right. Each pair marked off gives a digit in the square root; and, if there is an odd digit remaining, that digit also gives a digit in the square root.

EXAMPLES: There are three digits in the square root of 546121, and four in the square root of 5774409.

For, marking off the digits from the right, we get in the first case 54,61,21, giving three digits in the square root, and in the second case 5,77,44,09, the odd digit giving the fourth in the square root.

The method of finding the square root of a given number depends on the *form* of the square of the sum of two numbers.

EXPLANATION: The square root of 144 is 12. Let us see how we found it.

$12 = 1$ ten $+ 2$ units.
12^2 is the same as $(10 + 2)^2$.

Let us square $(10+2)$, that is, multiply $10+2$ by $10+2$.

$$\begin{array}{l} 10 + 2 \\ 10 + 2 \\ \hline 10^2 + (10 \times 2) \\ \quad + (10 \times 2) + 2^2 \\ \hline 10^2 + 2\,(10 \times 2) + 2^2 \end{array}$$

Then, $12^2 = 10^2 + 2\,(10 \times 2) + 2^2$

RULE.—*The square of any number made up of tens and units is equal to the square of the tens, plus twice the product of the tens by the units, plus the square of the units.*

ANOTHER EXPLANATION: Find the square root of 45369.

SOLUTION:

$$\begin{array}{r|l} & 4{\cdot}53{\cdot}69\,)213 \\ & 4 \\ \hline 41 & 53 \\ & 41 \\ \hline 423 & 1269 \\ & 1269 \\ \hline \end{array}$$

(1) Point off the number into periods of two figures each, as before.

(2) The square root of the first period is 2. $2 \times 2 = 4$. Write the 2 in the root and subtract the 4 from 4. Bring down the next period, 53.

(3) $2 \times 2 = 4$. (Remember the 4 is to be used as a trial divisor, being $2 \times$ the *tens*.)

4 is contained in 5 about 1 time. Place 1 in the root, also on the right of the 4 in the divisor. Multiply 41 by 1. Subtract and bring down the next period.

(4) $2 \times 21 = 42$. 42 is the *trial divisor*. $126 \div 42 =$ *about* 3 times. Place the 3 in the root also at the right of the 42 in the divisor. Mulitply out.

Square root $= 213$.

CUBE ROOT.—The *cube root* of a number is one of the three equal factors of that number.

Thus, 5 is the cube root of 125, because $5 \times 5 \times 5 = 125$.

The *radical sign* with a figure 3 over it ($\sqrt[3]{}$) means that the cube root of the number following it is to be taken.

$\sqrt[3]{125}$ reads, "The cube root of 125."

If we can find the prime factors of any perfect cube, we can write down its cube root by inspection.

EXAMPLE: Find the cube root of 74088.

$$\begin{array}{r|r} 8 & 74088 \\ \hline 9 & 9261 \\ \hline 3 & 1029 \\ \hline 7 & 343 \\ \hline 7 & 49 \\ \hline & 7 \\ \hline \end{array}$$

$\therefore 74088 = 8 \times 9 \times 3 \times 7 \times 7 \times 7$
$= 2^3 \times 3^3 \times 7^3$

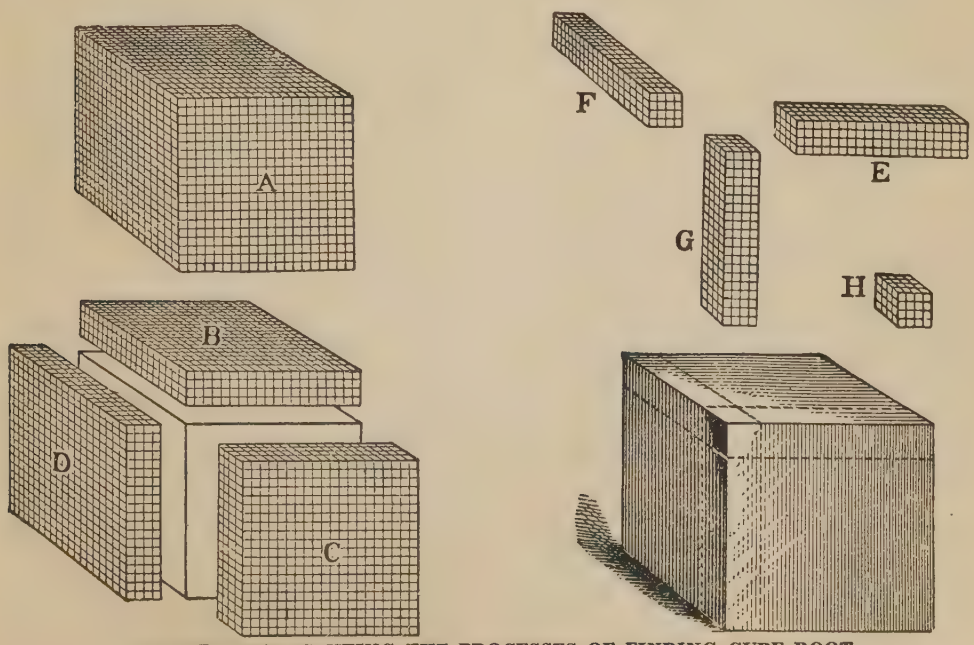
$\therefore \sqrt[3]{74088} = 2 \times 3 \times 7$
$= 42$ *Ans.*

RULE FOR DIGITS.—Since $1^3 = 1$ and $10^3 = 1000$, therefore the cube of a number which lies between 1 and 10 lies between 1 and 1000, *i. e.*, the cube of a number of one digit contains either one, two or three digits.

Again, since $10^3 = 1000$ and $100^3 = 1000000$, the cube of a number of two digits contains either four, five, or six digits.

Proceeding in this way, we see that the cube of a number contains three times, or one less or two less than three times, as many digits as the number.

Hence, to find the number of digits in the cube root of a given number, we mark off the digits in sets of three, beginning at the decimal point, and marking both to the right and to the left.



FIGURES REPRESENTING THE PROCESSES OF FINDING CUBE ROOT

Thus, 289383 will be pointed off into two periods—289·383—and we readily see there will be only 2 figures in the root.

The simplest method of finding the cube root of numbers whose prime factors are not known is analogous to the method of finding square root, being based upon the form of the cube of the sum of two numbers.

EXPLANATION: The cube root of 1728 is 12. Let us see how we found it.

$12 = 1 \text{ ten} + 2 \text{ units}$
$12^3 = (10 + 2)^3$
$(10 + 2)^3$ means $10 + 2 \times 10 + 2 \times 10 + 2$

$$\begin{array}{l}
10 + 2 \\
10 + 2 \\
\hline
10^2 + (10 \times 2) \\
\quad + (10 \times 2) + 2^2 \\
\hline
10^2 + 2\,(10 \times 2) + 2^2 \\
10 + 2 \\
\hline
10^3 + 2\,(10^2 \times 2) + (10 \times 2^2) \\
\qquad (10^2 \times 2) + 2\,(10 \times 2^2) + 2^3 \\
\hline
10^3 + 3\,(10^2 \times 2) + 3\,(10 \times 2^2) + 2^3
\end{array}$$

That is, the cube of any number made up of tens and units equals—

The cube of the tens + three times the product of the square of the tens by the units + three times the product of the tens by the square of the units + the cube of the units,

or

$\text{tens}^3 + 3\,(\text{tens}^2 \times \text{units}) + 3\,(\text{tens} \times \text{units}^2) + \text{units}^3.$

For graphic illustration the geometrical representation of the cube of units and tens in the drawings is helpful.

After the process is understood, this short method of writing the work may be used by the pupil:

EXAMPLE: Find the cube root of .0163956, carrying the root to 3 decimal places.

WORK:

$$\begin{array}{r|l}
.016\cdot395\cdot600 & .254 + \\
8 & \\
\hline
1200 & 8395 \\
300 & \\
25 & \\
\hline
1525 & 7625 \\
\hline
 & 770600 \\
187500 & \\
3000 & \\
16 & \\
\hline
190516 & 762064 \\
\hline
 & 8536
\end{array}$$

CHEMISTRY

ITS USE AND IMPORTANCE—WHAT IT IS—HOW IT DIFFERS FROM PHYSICS—ITS DIVISIONS—DISTINCTION BETWEEN THEORETICAL AND PRACTICAL CHEMISTRY—OUTLINE OF THEORETICAL CHEMISTRY—LAWS OF CHEMISTRY—ATOMIC THEORY—CHEMICAL NOTATION—MOLECULAR WEIGHTS—REACTIONS—CHEMICAL ARITHMETIC—BASES—QUANTIVALENCE—TESTS—TABLE OF CHEMICAL ELEMENTS—CHEMISTRY OF FAMILIAR THINGS—COMMON NAMES OF CHEMICALS—RADIO-ACTIVITY AND RADIO-ACTIVE SUBSTANCES—RADIUM AND ITS USES—THE SPINTHARISCOPE

IMPORTANCE OF CHEMISTRY

A certain amount of knowledge of chemistry is eminently useful in almost every walk of life. An intelligent knowledge of the chemistry involved in the processes of the kitchen, the dairy, the dye-house, the farm, or the manufactory, places the possessor engaged in any of these processes on a different level from the rule-of-thumb worker, who is as ignorant of the reason for adopting a particular method as he is of the properties of the materials he employs.

Technical chemistry deals especially with the application of the principles and processes of chemistry to the arts and manufactures, and it is to those who are engaged in manufactures of almost every kind that a knowledge of chemistry is a particular advantage.

It is not a question of expediency alone, but one of absolute necessity that a technical education, including chemistry as one of its principal subjects, should form not the least important part of the equipment for his work of any artisan who is to excel in his employment in intelligence and skill.

What is chemistry?

Chemistry is that branch of science which treats of the *intimate composition of matter*, and the changes produced in it when subjected to particular conditions—such as *temperature, pressure, mass, light, catalysis*, etc.

How does chemistry differ from physics?

The two branches, physics and chemistry, overlap a great deal, it being very difficult to draw the line of demarcation between them, particularly in the higher stages of the *physical* and *chemical* changes of matter.

For example, a steel needle rubbed on a magnet in a definite way undergoes *physical* change by means of which it acquires the power of the magnet. On the other hand, a match rubbed on a match-box undergoes a *chemical* change by means of which flame is produced. Thus it is possible to make a distinction between the sciences of physics and chemistry. A chemical change involves some alteration in the essential nature of the substance. The match having been ignited has undergone a permanent change, whereby it is no longer combustible. The physical change quoted above involves no alteration in the substance itself, and the acquired property is further only temporary and can be continually lost and reacquired.

The difficulty occurs in this fact, however, that every chemical change is accompanied by physical change, and the physical change may often be the only sign that chemical change has taken place.

What are the chief divisions of chemistry?

ORGANIC AND INORGANIC CHEMISTRY.—There are two great divisions in the science of chemistry, organic and inorganic. The branch which is best known is that of inorganic chemistry, which covers the chemistry of all the purely mineral substances. Organic chemistry has to do primarily with that of substances obtained from animal or vegetable sources. Now, however, it has resolved itself into the study of the compounds of carbon, always bearing in mind the fact that many carbon compounds have no organic origin, and therefore really fall outside the scope of organic chemistry.

The fundamentals of both branches are the same, and the real reason for the division is the number of the carbon compounds and their

highly complex character. It is in this realm that the graphic formula is of most service, and in its organic branch chemistry most nearly approaches biology.

The branch of inorganic chemistry which treats of the composition, etc., of naturally occurring minerals, receives the title of *mineralogical chemistry.*

PHYSICAL CHEMISTRY explains processes, formulates laws for these processes, and is divided within itself again into electro-chemistry and thermo-chemistry, etc. One branch of physical chemistry in which great strides have been made, is the study of the general properties of gases. But it is really as much in the realm of physics as it is in the realm of chemistry.

The study of the chemical nature of substances entering into the constitution of the animal organism, and the chemical changes taking place during the life processes of animals, forms the domain of *physiological chemistry.*

The investigation of the influence of soils, and manures, etc., of different compositions, upon vegetable life, and the chemical principles underlying the art of agriculture, are included in the province of *agricultural chemistry.*

Pharmaceutical chemistry deals with the nature and mode of preparation of the various drugs, ointments, etc., employed for medicinal purposes.

The science in its relations to the arts, manufactures, and industrial processes is embraced in the wide titles of *technical* and *applied chemistry.*

What is the difference between theoretical and practical chemistry?

There are in every science two great divisions. These are known as the "theory" and the "practice" (or, as they are sometimes called, the science and the art). The theory of any science is that part of it which forms the answer in any case to the question "Why?" The practice in the same way answers to the question "How?"

If we find, for example, that by putting a fire under a vessel of water, the water gradually begins to boil, as we say, "boils away," we have learned something that relates to *practice.* We have learned how to change water into vapor. It is not necessary that we should know why the result is brought about, so long as we are satisfied with the result alone.

But as soon as we begin to wish to bring about any result in the best possible way, we must inquire why a certain course of action causes the result; and in the case of the water, we ask why heat should make water boil and then disappear. The answer to the question "How?" is usually a simple one. It can be found out by experiment. Once having found out, we may usually repeat the work as often as we choose.

But the question "Why?" lies deeper, and sometimes cannot be answered at all. The answer to it is in all cases merely a guess—an attempt to explain more or less fully and satisfactorily. If we find that our explanation or theory makes it possible to foretell what will happen in new cases, then we may safely trust it and believe in it.

Give a clear, succinct outline of the essentials of theoretical chemistry.

The whole matter of molecules and atoms is one of *theory.* None of our senses can enable us to know directly either molecules or atoms. We can only imagine that they exist, and then give reasons why their existence makes clear to us the action of elements or of compounds one upon the other.

But in a course of descriptive chemistry, a good knowledge of theoretical chemistry is necessary in order to fully understand all that will be taken up.

THEORETICAL CHEMISTRY

(1) DEFINITIONS.—An element is a substance that *cannot* be decomposed.

A compound is a substance that *can* be decomposed into other different substances; and if the decomposition goes far enough, these substances will be elements.

A mixture is made up of two or more components (elements and compounds or both), *physically* put together. It differs from a compound whose compounds are *chemically* united.

(2) LAWS.—*Law of Definite Proportions:* All specimens of a compound contain the same elements in the same proportions.

Law of Multiple Proportions: When two compounds consist of the same elements, the proportion of one is a simple multiple of the proportion of the other.

Law of Combining Proportions: Each element enters into all its compounds by a fixed proportional weight.

The fundamental laws of chemistry are proved by experiment.

(3) THE ATOMIC THEORY.—The atomic theory teaches that matter is composed of minute particles which themselves cannot be divided, but which unite to form molecules which can be divided.

A *molecule,* then, is the smallest amount of a substance that can exist in a free state.

The diameters of molecules have been ascertained by Jeans to be—

Hydrogen.....20.3
Nitrogen.....29.1
Oxygen.....27.3

These figures express number of billionths of a meter.

An *atom* is an indivisible particle of an element, and goes to make up the molecule.

(4) CHEMICAL NOTATION.—The symbols used to represent the different elements (*e.g.* H for hydrogen, O for oxygen, etc.), when used in chemical compounds, refer to the number of atoms which go to make up the molecule of that particular compound. For example, the expression H_2SO_4 means that in one molecule of that acid there are 2 atoms of hydrogen, 1 of sulphur, and 4 of oxygen.

(5) MOLECULAR WEIGHTS.—To determine the molecular weight of a compound it is necessary to know *Avogadro's Law:* Equal volumes of all gases under the same conditions contain the same number of molecules; and Molecular Weight = Vapor Density $\times$ 2.

(6) REACTIONS.—A reaction or chemical equation is a method of representing a chemical change.

In chemistry we have three kinds of reactions, namely:

(1) *Analytical* reaction, which is the breaking up of compound bodies into simple, *e.g.*, H_2CO_3 can be broken up into its components, H_2O and CO_2, *e.g.*, $H_2CO_3 = H_2O + CO_2$.

(2) *Synthetical* reaction is the building up of a compound body by the union of two or more simple bodies, *e.g.*, $H_2+O=H_2O$ and $H+Cl=HCl$.

Metathetical reaction consists in the interchange of two radicals in two substances, *e.g.*, $2HCl+Zn=ZnCl_2+H_2$. Here the H of the acid is replaced by the Zn.

$KCl+AgNO_3=AgCl+KNO_3$. Here the Ag and the K change places.

(7) THE CHEMICAL ARITHMETIC by which from the molecular weights of two substances, and the weight of one substance we are enabled to get the weight of the required substance is called Stoichiometry.

EXAMPLE: Required the amount of zinc necessary to generate 10 grams of hydrogen.

Atomic weights of H, Cl, and Zn are respectively 1, 35.5, and 65.3.

The reaction is as follows:—

$Zn+2HCl=ZnCl_2+H_2$, and shows that 2 atoms of H are used for every 1 of Zn.

(Mol.Wt.Zn.) (Mol.Wt.H_2) (Wt.Zn.) (Wt.H_2.)

65.3 : 2 = x : 10

$$\frac{65.3\times10}{2} = x = 326.5 \text{ grams of Zn.}$$

(8) BERTHOLLET'S LAW.—Berthollet established the following law, which is of great importance. When two substances can form a substance insoluble or volatile, under the condition of the reaction, that substance will be formed till one of the factors is exhausted.

(9) RADICALS.—A radical is an atom or group of atoms which changes places in a reaction. A compound radical is made up of different sorts of radicals, as NH_4.

A basic radical is a metal, or a compound radical which behaves like a metal, *e.g.*, Zn and NH_4.

(10) HYDRATES.—A hydrate is a substance formed from water by replacing half of its hydrogen by a radical, *e.g.*, $H_2O+2Na=2NaOH+H_2$, where the sodium has taken the place of one atom of hydrogen.

(11) BASE.—If a hydrate is formed by a basic radical, the hydrate is called a base, *e.g.*, ZnO_2H_2.

(12) ALKALI.—An alkali is a soluble base, *e.g.*, NaOH, KOH, NH_4OH, LiOH.

(13) ACID.—An acid is a substance containing hydrogen which may be replaced by a basic radical, *e.g.*, $2HCl+Zn=ZnCl_2+H_2$.

(14) SALTS.—A salt is a substance formed from an acid replacing its hydrogen by a basic radical, *e.g.* $2HCl+Zn=ZnCl_2+H_2$.

An acid salt is a compound derived from an acid which has not all of its hydrogen replaced, *e.g.*, $2NaCl+H_2SO_4=NaHSO_4+HCl+NaCl$.

(15) CHEMICAL NOMENCLATURE.—*Termination* "—UM" is now applied to all *Metals*, though the older-known metals retain the former names, *e.g.*—Aluminium, Tellurium, etc.

Termination "—IDE" denotes a *Binary Compound*, that is, a substance composed of only two elements, *e.g.*, Sodium Chloride (NaCl).

Termination "—OUS" is applied to the first of two elements when it exists in a greater proportion than in another combination with the same element, *e.g.*, one atom of phosphorus and three atoms of chlorine form *Phosphorous Chloride*.

Termination "—IC," when the first exists in a lesser proportion, *e.g.*, one atom of phosphorus with five atoms of chlorine form *Phosphoric Chloride*.

Prefixes "MONO—," "BI—," "TRI—," etc., indicate the proportion of the latter of two elements, and are sometimes used instead of the above termination. Thus phosphorous chloride may also be called *Phosphorous Tri-Chloride;* so one atom of carbon with one atom of oxygen is *Carbon Monoxide.*

Prefix "HYPO—" (under) and "PER—" (over), specify compounds formed by the same two elements containing less (or more) of an element than is in the usual compound.

Nomenclature of Salts.—From the common acids we get the following salts:—

HCl	forms chlorides.
HNO_3	forms nitrates.
H_2SO_4	forms sulphates
H_2S	forms sulphides
H_2CO_3	forms carbonates.
H_2O	forms no salts.
H_2SiO_4	forms silicates.
H_3PO_4	forms phosphates.

A rough rule for the nomenclature of acids may be made from the above. Acids with the prefix *hydro* and the suffix *ic* form salts in *ide;* with suffix *ate*, salts in *ate;* with suffix *ous*, salts in *ite*.

(16) BASICITY.—The basicity of a substance is measured by the amount of hydrogen which it contains that can be replaced by a basic radical, *e.g.*, H_2SO_4 is di-basic, *i.e.*, the two atoms of hydrogen can be replaced by a basic radical. $H_2SO_4+CaCl_2=CaSO_4+2HCl$.

(17) QUANTIVALENCE.—The quantivalence of an element is measured by the number of atoms of hydrogen it combines with or replaces. *E.g.*, Na is univalent, for when added to HCl it replaces one atom of hydrogen; Ca is bivalent, for, as seen in the above reaction, it replaces two atoms of hydrogen.

(18) TEST FOR A CHLORIDE.—To test for HCl or any chloride, add to the solution to be tested a little $AgNO_3$, and if a chloride is present, a milky-white precipitate will be formed. The reaction is as follows: $HCl+AgNO_3=AgCl$ (white precipitate) $+HNO_3$. A metal almost invariably changes places with hydrogen.

Caution.—In diluting H_2SO_4 add the acid to the water; for the evolution of heat from the process will cause the water to boil, and reversing this process will cause the liquid to boil over and possibly result disastrously.

(19) IMPURITY IN H_2SO_4.—Commercial sulphuric acid contains $PbSO_4$ as an impurity. This gives it the colored appearance, plumbic sulphate being soluble in strong sulphuric acid.

(20) H_2S.—Sulphuretted hydrogen is somewhat soluble in water, slightly poisonous, and is a reducing agent.

(21) CARBONIC ACID.—H_2CO_3 does not exist as an acid. We infer its existence from the presence of its salts. $Na_2CO_3+2HCl=2NaCl+H_2CO_3$, but the H_2CO_3 is so unstable that it breaks up at once into H_2O and CO_2.

(22) TEST FOR A CARBONATE.—To test for a carbonate, treat the substance with an acid; CO_2 is formed; pour the gas into a solution of lime-water, and a white insoluble precipitate is formed, $CaCO_3$.

TABLE OF ALL THE KNOWN CHEMICAL ELEMENTS

The *Chemical Elements* are the simplest known constituents of all compound substances. Chemists regard them as elements or elementary substances only when they have been proved to be *not* compound. The elements are somewhat arbitrarily divided into metals and non-metals, the former constituting by far the larger class. Several elements occupy positions on the border line. Below is a list of the elements at present known with certainty, and of their atomic weights as fixed by the various kinds of evidence obtained by very numerous, and in many cases varied, experiments. The values are all referred to oxygen as standard with atomic weight 16, and are those adopted, for 1910, by the International Commission on Atomic Weights. The standard O = 16 has been pretty generally adopted by chemists as, upon the whole, more satisfactory than H = 1.

Abbreviations.—At. wt., atomic weight; S. G., specific gravity; M. P., melting point; B. P., boiling point; C. T., critical temperature.

Name and Important Data	Occurrence, Preparation and Properties	Compounds and Chief Uses
Aluminum. Symbol Al. At. wt. 27.1. Valence III. S. G. 2.7. M. P. 658°. B. P. 1800°.	Occ.—cryolite AlF_3, $3NaF$; bauxite, impure $Al(OH)_3$; in feldspars, micas and clay; emery, ruby, sapphire (Al_2O_3). Prep.—com'l, by electrolysis of Al_2O_3, from bauxite, dissolved in cryolite, water-power usually furnishing the electrical energy. Prop.—silver-white, ductile, malleable at 120°, tensile strength (wrought) 16 tons per sq. in. A better conductor of electricity, weight for weight, than copper. Molten metal not mobile enough to make castings. It turns badly in the lathe. Acted upon by dil. hydrochloric acid, slowly by sulphuric, but not by nitric or the acids occurring in foods. Soluble in alkaline hydroxides. The tarnishing action of moist air soon comes to an end as the tarnish acts as an adherent protective coating.	Used for cooking utensils, boat-building, military accouterments and small articles requiring lightness and strength; for electric leads. The powdered metal is used as a body for paint; and its mixture with ferric oxide, called thermite, is used for producing very high temperatures (up to 3700°C.) for welding rails, etc. Many metals are reduced from their oxides by means of Al, hence its use in casting steel. Aluminum bronze (10% Al), rolled, has tensile strength of 40 tons per sq. in. Its sulphate forms alums, e. g., $KAl(SO_4)_2$, $12H_2O$, common alum.
Antimony. Symbol Sb. At. wt. 120.2. Valence III. and V. S. G. 6.6. M. P. 630.7°. B. P. 1440°.	Occ.—free, and as stibnite (Sb_2S_3). Prep.—roasting stibnite gives Sb_2O_4, which is then reduced by heating with carbon. Prop.—white, brittle, crystalline metal. Its alloys expand on solidification, and therefore give very sharp castings, e. g., for type. It does not tarnish, but may be burned in air, and unites directly with the halogens.	The metal is a constituent of the alloy type metal, Britannia metal and Babbitt metal (used for bearings). Its oxide (Sb_2O_3) is both basic and acidic. The trichloride, butter of antimony ($SbCl_3$), is easily hydrolyzed. Tartar emetic ($SbOKC_4H_4O_6$) is used in medicine and in dyeing.
Argon. Symbol A. At. wt. 39.86. Valence nil. Density 39.9 (oxygen =32). B. P. —186°. M. P. —190°.	Present in the air 0.94% by volume. To isolate, air is freed from CO_2 by soda-lime, water by P_2O_5, oxygen by red-hot copper, nitrogen by magnesium and calcium. From the residual mixture argon is obtained by fractional distillation.	Forms no compounds, hence its name—does no work. Is a monatomic gas and is identified by its characteristic spectrum seen by examining the light emitted when the gas is placed in a vacuum tube at low pressure and sparked. More soluble in water than nitrogen, 100 vols. water dissolving 4 vols. argon under ordinary conditions.
Arsenic. Symbol As. At. wt. 74.96. Valence III. and V. S. G. 5.7. B. P. 616°(sublimes). M. P. above 800° (under pressure).	Occ.—free, as arsenical pyrites (FeSAs), as orpiment (As_2S_3) and as realgar (As_2S_2). Prep.—by heating arsenical pyrites, FeSAs—FeS + As. Prop.—a steel-gray, dully-metallic and crystalline element classed as a metalloid because intermediate between metals and non-metals. Its vapor has a density corresponding to As_4 at 644°, and to As_2 at 1700°. It burns in air and unites directly with the halogens, sulphur and with many metals.	Used for hardening lead for shot. All its compounds are poisonous. White arsenic (As_2O_3) is partly basic, forming a chloride and partly acidic, forming arsenites. Scheele's green ($CuHAsO_3$) is a pigment dangerous in wallpapers. Traces of arsenic are detected by Marsh's test, in which the intensely poisonous arsine (AsH_3) is formed.
Barium. Symbol Ba. At. wt. 137.37. Valence II. S. G. 3.8. M. P. 850°.	Occ.—as barytes or heavy-spar ($BaSO_4$), and as witherite ($BaCO_3$). Prep.—by electrolysis of the fused chloride. Prop.—a silver-white, lustrous, malleable metal harder than lead. Like calcium, it acts slowly on water to give barium hydroxide and hydrogen. The vapors of its compounds impart a green color to the Bunsen flame.	The peroxide (BaO_2) is used in the manufacture of oxygen and of hydrogen peroxide. The nitrate and chlorate in pyrotechny to give green fires. The sulphate as the body for a permanent white paint and for filling glazed paper. All soluble compounds are poisonous.
Bismuth. Symbol Bi. At. wt. 208.0. Valence III.(and V.). S. G. 9.8. M. P. 270.9°. B. P. 1420°.	Occ.—free and as trioxide (Bi_2O_3) and trisulphide (Bi_2S_3). Prep.—the ore is roasted and then heated with charcoal and metallic iron (to remove traces of sulphur.) Prop.—an exceedingly brittle, crystalline shining metal, white with a tinge of pink. Bismuth expands on solidification. It does not tarnish, but can be burnt in air. Dissolves in oxygen acids.	Used for making fusible alloys, e. g. Wood's metal, M. P. 60.5°, which are used in plugs of fire sprinklers and boiler safety valves, and for taking casts. The oxynitrate is used in medicine and as a cosmetic.
Boron. Symbol B. At. wt. 11.0. Valence III. S. G. (amorph.) 2.4; (cryst.) 2.5. B. P. 3500° (sublimes).	Occ.—as boric acid (H_3BO_3), borax ($Na_2B_4O_7$, $10H_2O$), colemanite ($Ca_2B_6O_{11}$,$5H_2O$). Prep.—amorphous boron by reducing B_2O_3 with Mg. Impure cryst. boron by reducing B_2O_3 with excess of Al. Prop.—amorphous boron is a greenish-black powder that burns in air at 700°, forming B_2O_3 and also BN. It is oxidized, by hot conc. sulphuric or nitric acids, to boric acid.	The compounds are analogous to those of silicon. Borax is used as a flux, and, in solution, as a mild alkali on account of its hydrolysis. Boric acid is used as a weak antiseptic and preservative.

TABLE OF ALL THE KNOWN CHEMICAL ELEMENTS—Continued

Name and Important Data	Occurrence, Preparation and Properties	Compounds and Chief Uses
Bromine. Symbol Br. At. wt. 79.22. Valence I. S. G. 3.1. B. P. 59°. M. P. —7.3°.	Occ.—in seawater as alkali bromide, and in the upper layers of salt deposits as sodium and magnesium bromide. Prep.—by treatment of the brines with sulphuric acid and manganese dioxide, or else with chlorine. Prop.—a dark red liquid, smelling like chlorine, whose vapor irritates eyes, throat and nose. Dissolves in thirty parts of water (bromine water). Combines directly with most other elements, but less vigorously than chlorine.	Potassium bromide is used in medicine, silver bromide in photography. Bromine is used in course of the preparation of organic dyes.
Cadmium. Symbol Cd. At. wt. 112.40. Valence II. S. G. 8.6. M. P. 320.9. B. P. 766°.	Occ.—in association with the zinc ores, as carbonate and sulphide. Prep.—in the distillation of impure zinc, the cadmium comes over in the first portions. Prop.—a silver-white metal, more ductile and malleable than zinc. It burns in air, and is attacked by dilute acids.	All the compounds are poisonous, and little ionized. The sulphide (CdS) is the basis of "cadmium yellow." The iodide is used in medicine.
Caesium. Symbol Cs. At. wt. 132.81. Valence I. S. G. 1.9. M. P. 26.3°. B. P. 670°.	Occ.—in certain micas, and in the ashes of certain plants. Prep.—by heating the hydroxide (CsOH) with magnesium. Prop.—a white, silvery metal resembling potassium. It is one of the most active of metals, and decomposes water violently.	The compounds are characterized by giving, especially, two bright lines in the blue of the spectrum (caesius sky-blue).
Calcium. Symbol Ca. At. wt. 40.07. Valence II. S. G. 1.55. M. P. 803°.	Occ.—as carbonate (Iceland spar, calcite, aragonite, marble, chalk, limestone), sulphate (gypsum), phosphate (apatite), fluoride (fluor spar), and as complex silicates in great variety (feldspars, pyroxenes, amphiboles, etc.). Prep.—by electrolysis of the fused chloride. Prop.—a white crystalline metal, harder than lead, that can be cut, drawn, rolled and turned. It attacks water, and burns in the air at a red heat, forming the oxide (CaO) and the nitride (Ca_3N_2). It unites with hydrogen to CaH_2, whose action on water is a source of hydrogen for balloons.	Calcium oxide (quicklime) is used for mortar and to remove hair from hides. The hydroxide [$Ca(OH)_2$] mixed with sand forms mortar; its solution is limewater. Plaster of paris, a less hydrated sulphate, takes up water on setting to form $CaSO_4,2H_2O$. The phosphates are fertilizers. Bleaching powder is CaClOCl and calcium carbide is CaC_2. Common glass contains silicates of calcium and sodium.
Carbon. Symbol C. At. wt. 12.005. Valence IV. S. G. diamond 3.5: graphite 2.3: amorphous 1.9 M. P.—not realized; estimated at 4400°	Occ.—as diamond and graphite, in the free state; in combination with hydrogen as petroleum, with oxygen as carbon dioxide in the air, with these and other elements as coal, and in plant and animal tissues; and as many carbonates. Prep.—by dry distillation of wood or coal, yielding charcoal and coke respectively. Prop.—diamond is crystalline and the hardest of minerals, the dark-colored "bort" being used for cutting and grinding. Graphite has a black metallic luster, is crystalline and may be scratched by the finger-nail. Charcoal is amorphous, and possesses the power of absorbing gases and also coloring matters. All three forms burn in oxygen to produce carbon dioxide.	The carbon compounds form the subject of "Organic Chemistry." Carbon dioxide results from the burning of coal, coke, wood, oil or illuminating gas; from fermentation and decay, which are slow burnings; and is exhaled in the breath. Carbon monoxide, arising from recently-stoked fires, is an exceedingly poisonous gas.
Cerium. Symbol Ce. At. wt. 140.25. Valence III., IV. (and VI.). S. G. 6.8; M. P. 623°	Ccc.—as silicate in cerite, along with Nd, Pr and La; also in monazite sand. Prep.—by electrolysis of the fused chloride. Prop.—a metal with the color and luster of iron, like tin in hardness, and very ductile and malleable. Burns in air more easily and brightly than magnesium.	Welsbach incandescent gas mantles contain one per cent of cerium dioxide, CeO_2.
Chlorine. Symbol Cl. At. wt. 35.46. Valence I. (and VII.). S. G. (liquid) 1.3. M. P. —101° B. P. —33.6°. C. T. +146°.	Occ.—in seawater as chlorides of the alkalis and alkaline earths, and as like compounds in salt deposits. Prep.—by electrolysis of alkali chloride, fused or in solution; or by the action of manganese dioxide on hydrochloric acid. Prop.—a greenish-yellow gas of characteristic odor, with a violent action on the respiratory tract. Unites directly with all elements save oxygen, nitrogen and the argon family. Displaces bromine and iodine from bromides and iodides, and substitutes hydrogen in organic compounds.	The gas is used in extracting gold and in preparing bleaching and disinfecting agents. In presence of water it bleaches many coloring matters. Forms chlorides (as NaCl, HCl, $CaCl_2$), hypochlorides [as solution of $Ca(OCl)_2$], chlorates (as $KClO_3$, used for matches and in pyrotechny), and perchlorates (as $KClO_4$).
Chromium. Symbol Cr. At. wt. 52.0. Valence II., III. and VI. S. G. 6.6. M. P. 1515°. B. P. 2200°.	Occ.—as chromite [$Fe(CrO_2)_2$]. Prep.—by reducing Cr_2O_3 with aluminium filings. Prop.—a steel-gray, lustrous, brittle and very hard metal. At high temperatures it burns in air to green Cr_2O_3. It is attacked by dilute sulphuric or hydrochloric acid, but not by nitric acid.	The alloy ferrochromium is used in steel-making. Chrome green, the pigment, is Cr_2O_3. Chrome yellow is $PbCrO_4$. Bichromates (as $K_2Cr_2O_7$) are used in photo-proceses, tanning and dyeing and as oxidizing agents, e.g., in batteries.
Cobalt. Symbol Co. At. wt. 58.97. Valence II. and III. S. G. 8.6. M. P. 1490°.	Occ.—as smaltite ($CoAs_2$) and cobaltite (CoAsS). Prep.—by igniting the oxide in hydrogen. Prop.—a white, magnetic, malleable metal, less tenacious than iron. By exposure it turns pinkish. It is less active chemically than iron.	Its intensely blue silicates are used in coloring porcelain and constitute the pigment smalt.
Columbium (Niobium) Symbol Cb. At. wt. 93.5. Valence I., II., IV. and V. S. G. 12.7. M. P. 1950°.	Occ.—in the mineral columbite. Prep.—by reduction of CbO_2 by paraffin. Prop.—a light-gray, malleable and ductile metal, as hard as wrought iron, which is not affected by acids, even by aqua regia.	The hydride (CbH) burns in air. The compounds occur with those of tantalum, which they closely resemble.

TABLE OF ALL THE KNOWN CHEMICAL ELEMENTS—Continued

Name and Important Data	Occurrence, Preparation and Properties	Compounds and Chief Uses
Copper. Symbol Cu. At. wt. 63.57. Valence I. and II. S. G. 8.9. M. P. 1083°. B. P. 2310°.	Occ.—free, as cuprite (Cu_2O), copper glance (Cu_2S), chalcopyrite (Cu_2S, Fe_2S_3), malachite [$CuCO_3$, $Cu(OH)_2$]. Prep.—after removal of iron and sulphur, the oxide is reduced by heating with carbon. It is refined electrolytically. Prop.—a red, lustrous, very ductile and malleable metal of tensile strength fourteen tons per square inch, second only to silver in electrical conductivity. In ordinary air it gradually becomes coated with basic carbonate. In absence of air, nitric acid alone among the dilute acids attacks it, but in presence of air even the acids found in foodstuffs can dissolve it.	The metal is used for coins, electroplating, electric leads, roofing, cooking vessels and for making alloys, such as brass, bell and gun metals, German silver and the bronzes. The soluble compounds are poisonous, and are therefore used as germicides in agriculture. Blue vitriol is $CuSO_45H_2O$; the basic acetate is verdigris.
Dysprosium. Symbol Dy. At. wt. 162.5. Valence III.	Occ.—in monazite, gadolinite, etc. Prep.—not yet isolated. Prop.—the oxide dysprosia, along with three other rare earths, constitutes erbia.	The salts are green or yellow in color and show characteristic absorption bands.
Erbium. Symbol Er. At. wt. 167.7. Valence III. S. G. 4.8.	Occ.—same as for dysprosium. Prep.—not yet isolated pure. Prop.—crude erbia has been separated into erbia, holmia, thulia, and dysprosia.	The salts are rose-colored, and show characteristic absorption spectra.
Europium. Symbol Eu. At. wt. 152.0. Valence III.	Occ.—in monazite and other rare minerals. Prep.—not yet isolated. Prop.—this element so closely resembles samarium that the analytical separation of the two is difficult.	The salts are pinkish and show a faint absorption spectrum.
Fluorine. Symbol F. At. wt. 19.0. Valence I. S. G. (liquid) 1.11 at —187°. M. P. —223°. B. P. —187°.	Occ.—as cryolite (AlF_3, $3NaF$), fluor spar (CaF_2) and very widely elsewhere in small quantities. Prep.—by electrolysis of dry hydrogen fluoride at —23°. Prop.—a pale yellowish-green gas that unites with every element excepting oxygen and the argon family. It rapidly displaces oxygen from water or chlorine from hydrogen chloride.	Hydrogen fluoride is used for etching glass and in silicate analysis. Silver fluoride is soluble and calcium fluoride insoluble, in contrast with the other halides of these metals.
Gadolinium. Symbol Gd. At. wt. 157.3. Valence III.	Occ.—in gadolinite and samarskite. Prep.—not yet isolated. Prop.—This element closely resembles terbium in its compounds.	The salts are colorless and show no absorption bands.
Gallium. Symbol Ga. At. wt. 69.9. Valence III. S. G. 5.9. M. P. 30.1°.	Occ.—in zinc blende and in bauxite. Prep.—by electrolysis of a suitable solution of its salts. Prop.—a bluish-white, tough metal that may be cut with a knife. Like aluminium, it is soluble in hydrochloric acid and in caustic alkali, but not in nitric acid.	It forms two chlorides ($GaCl_3$ and $GaCl_2$) which yield spark spectra very characteristic of gallium.
Germanium. Symbol Ge. At. wt. 72.5. Valence II. and IV. S. G. 5.5. M. P. 958°.	Occ.—in the rare mineral argyrodite. Prep.—by the reduction of the dioxide (GeO_2) by carbon. Prop.—a grayish-white, brittle, lustrous metal, insoluble in hydrochloric acid. It combines directly with the halogens.	The close relation of this element to carbon and silicon is shown in the compound germanium chloroform ($GeHCl_3$).
Glucinum (or Beryllium). Symbol Gl. At. wt. 9.1. Valence II. S. G. 1.7. M. P. below 960°.	Occ.—in beryl [$Al_2Gl_2(SiO_3)_6$]. Prep.—by electrolysis of the fused double fluoride, $GlF_2,2KF$. Prop.—a hard, white metal that tarnishes when heated in air, and is soluble in dilute acids when powdered.	Its hydroxide [$Gl(OH)_2$] is feebly acidic as well as basic, thus resembling the hydroxide of zinc. Emerald is beryl colored green by chromium.
Gold. Symbol Au. At. wt. 197.2. Valence I. and III. S. G. 19.32. M. P. 1062.4°.	Occ.—chiefly free, but also as telluride; many specimens of iron pyrites are auriferous. Prep.—from gold-bearing sands by washing away the lighter material, and dissolving the gold from the residue by mercury, which is subsequently separated from the gold by distillation. Quartz ores are pulverized in stamping mills, and the powder is then carried by water over amalgamated copper plates on which the gold collects. Prop.—a soft, bright-yellow metal, easily scratched by the knife, an excellent conductor of heat and of electricity. The most ductile and the most malleable of all the metals. Chemically, gold is rather inert, and is not attacked by the oxygen of the air, by hydrogen sulphide, nor, indeed, by any single one of the common acids. It is attacked by fused alkalis, yielding aurates, and by aqua regia, yielding chlorauric acid ($HAuCl_4$).	Pure gold is called 24-carat gold. American, French and German gold coins are 21.6 carat, while British sovereigns are 22 carat, the balance in all these cases being copper. Jewelry is made in 18, 14, 9, etc., carat gold, the addition of copper increasing the hardness and rigidity. Sodium chloraurate ($NaAuCl_4$) is used for "toning" in photography, while potassium auricyanide [$KAu(CN)_4$] is used in electrogilding.
Helium. Symbol He. At. wt. 4.00. Valence 0. S. G. (liquid at B.P.) 0.122. M. P. 272°. B. P. —268.7°.	Occ.—in air to the extent of one to two volumes per million; also occluded in certain minerals. Prep.—neon and helium are boiled off crude argon, and the neon solidified by cooling. Prop.—the lightest gas after hydrogen, transparent, odorless and colorless, very inert, forming no compounds with other elements.	It is one of the decomposition products of certain other (radio-active) elements.

TABLE OF ALL THE KNOWN CHEMICAL ELEMENTS—Continued

Name and Important Data	Occurrence, Preparation and Properties	Compounds and Chief Uses
Holmium. Symbol Ho. At. wt. 163.5. Valence III.		
Hydrogen. Symbol H. At. wt. 1.008. Valence I. S. G. (liquid at B.P.) 0.07. M. P. —259°. B. P. —252.5°.	Occ.—in air to the extent of one volume per 20,000 volumes air; combined, in water (11.19% by weight) natural gas, petroleum and all animal and vegetable bodies. Prep.—by treating zinc with hydrochloric or sulphuric acid; by electrolysis of water. Prop.—the lightest gas, transparent, odorless and colorless, soluble in water (2 volumes in 100 volumes water under everyday conditions), in platinum, in palladium (502 volumes in 1 of pd). Burns in air and in chlorine, and unites with many of the other elements.	Its two oxides are water (H_2O) and hydrogen peroxide (H_2O_2), the latter of which is used in solution as a bleaching agent. Every acid contains hydrogen as an essential constituent. Its compounds with carbon and other elements number over 100,000. Hydrogen gas is used for the oxyhydrogen flame and for filling balloons.
Indium. Symbol In. At. wt. 114.8. Valence III. and I. S. G. 7.3. M. P. 155°.	Occ.—in zinc blende (ZuS). Prep.—electrolytically from solutions of its salts. Prop.—a white metal, malleable and softer than lead.	Its compounds color the nonluminous gas flame blue and show a characteristic blue line in the spectrum.
Iodine. Symbol I. At. wt. 126.92. Valence I., V. and VII. S. G. 4.94. M. P. 114°. B. P. 184°.	Occ.—in the ocean, in certain seaweeds, and in Chili saltpeter, always in the combined state. Prep.—from iodides by displacement of their iodine by chlorine. Prop.—a dark gray, brittle solid with a metallic luster. Its vapor is violet, as are its solutions in chloroform and in carbon bisulphide. It requires over 5,000 parts of water for its solution. Combines directly with many elements, but is much less active than chlorine and bromine.	Its tincture is used in medicine as a counterirritant. Potassium iodide (KI) and iodoform (CHI_3) likewise find application in medicine. The alkyl iodides (e.g., C_2H_5I) are much used in synthetic organic chemistry.
Iridium. Symbol Ir. At. wt. 193.1. Valence III. and IV. S. G. 22.4. M. P. 2300°.	Occ.—along with platinum. Prep.—by a complex series of operations from platinum ores. Prop.—a white metal, brittle when cold, and very hard. It is attacked by fused alkalies, but not by aqua regia.	It is used for pointing gold pens. Its alloy with nine parts of platinum is used for standard meter bars on account of its inalterability.
Iron. Symbol Fe. At. wt. 55.85. Valence II. and III. S. G. 7.86; pig 7.03 to 7.73. M. P. 1515°. B. P. 2450°. wrought 1100°-1500°. steel 1375°. gray pig 1275°. white pig 1075°.	Occ.—as magnetic oxide (Fe_3O_4), hematite (Fe_2O_3), limonite ($2Fe_2O_3,3H_2O$), siderite (Fe_2CO_3), which are important ores; iron pyrites (FeS_2); in rocks as complex silicates, and in plants and animals. Prep.—pig iron is prepared in the blast furnace by reduction of the ore by means of carbon monoxide in presence of a suitable flux. From pig iron, wrought iron is obtained by puddling, and steel by the Bessemer, Siemens-Martin or other process. Prop.—a white, malleable, ductile, magnetic metal, unchanged in dry air or air-free water, but rusting in moist air. Easily attacked by dilute acids, but not by fused alkalies. Cast iron contains 2 to 5% of carbon and other impurities, and is hard and brittle. Wrought iron contains less than 0.2% of carbon, and is softer and tougher, with a tensile strength of 22 to 25 tons per square inch. Steel contains from 0.2 to 1.5% of carbon, is permanently magnetic, may be tempered, and possesses tensile strength up to 100 tons per square inch.	The metal is used as a structural material, for rails, machinery, tools, etc. Jeweler's rouge and Venetian red consist of the oxide (Fe_2O_3). Rust is chiefly the hydrated oxide (FeO, OH). Hammer scale and loadstone have the composition Fe_3O_4. Ferric chloride ($FeCl_3$), ferrous iodide (FeI_2) and other iron compounds are used in medicine. Green vitriol ($FeSO_4,7H_2O$) is used in making ink, and in dyeing. Potassium ferrocyanide [$K_4Fe(CN)_6$] is used for making Prussian blue, potassium cyanide, etc.
Krypton. Symbol Kr. At. wt. 82.92. Valence 0. S. G. (Liquid at B.P.)2.2 M. P. —169°. B. P. —152°.	Occ.—in minute quantity in the air. Prep.—from crude argon by fractional distillation. Prop.—an inert, colorless, odorless gas, resembling, but denser than, argon.	It forms no compounds, and is identified by its characteristic spectrum.
Lanthanum. Symbol La. At. wt. 139.0. Valence III. and V. S. G. 6.15. M. P. 810°.	Occ.—as lanthanite [$La_2(CO_3)_3,8H_2O$]. Prep.—by electrolysis of fused $LaCl_3$. Prop.—an iron-gray metal tarnishing in air to steel-blue; malleable and ductile. Attacked slowly even by cold water.	When heated in air it forms oxide (La_2O_3) and nitride (LaN).
Lead. Symbol Pb. At. wt. 207.20. Valence II., IV. S. G. 11.4. M. P. 327.2°. B. P. 1525°.	Occ.—as galena (PbS), and in silver ores. Prep.—by calcination of partially roasted galena. Purification is effected by Parkes process. Prop.—a soft, gray metal, malleable, but of low tensile strength. In presence of air, water acts on lead to produce the hydroxide, which being slightly soluble, may cause lead poisoning, if present in water supplies. When heated in air it is oxidized to litharge (PbO), and, under suitable conditions, to minimum (Pb_3O_4).	The metal is used for water pipes, roofs and gutters and storage batteries. For shot it is alloyed with 0.4% of arsenic. Typemetal contains 20% of antimony. Babbitt metal, for bearings, contains over 70% of lead. Solder and pewter are alloys of lead and tin. The basic carbonate [$Pb(OH)_2,2PbCO_3$], "white lead," is the basis of most oil paints.
Lithium. Symbol Li. At. wt. 6.94. Valence I. S. G. 0.53. M. P. 186°. B. P. above 1400°.	Occ.—as a mixed fluoride with aluminium in amblygonite. Prep.—by electrolysis of the fused chloride. Prop.—a silver-white metal, softer than lead, that tarnishes quickly in air, and is easily acted upon by water. When heated, it unites vigorously with nitrogen.	The carbonate [$Li_2(CO_3)$] is used in medicine as a solvent for uric acid, lithium urate being soluble. The lithium salts give a carmine flame coloration.

TABLE OF ALL THE KNOWN CHEMICAL ELEMENTS—Continued

Name and Important Data	Occurrence, Preparation and Properties	Compounds and Chief Uses
Lutecium. Symbol Lu. At. wt. 175.0.	Occ.—in euxenite. Prep.—it has not been isolated.	Its compounds resemble those of ytterbium.
Magnesium. Symbol Mg. At. wt. 24.32. Valence II. S. G. 1.75. M. P. 650°. B. P. 1120°.	Occ.—as magnesite ($MgCO_3$), dolomite ($MgCO_3$, $CaCO_3$), carnallite ($MgCl_2$, KCl, $6H_2O$) and in very many complex silicates. Prep.—by electrolysis of dried, fused carnallite. Prop.—a silver-white metal, ductile when hot. It tarnishes in air, and acts slowly upon water, rapidly on steam. Burns in air to the oxide MgO, emitting a very bright light used in photography. It unites directly with nitrogen.	The sulphate ($MgSO_4,7N_2O$) is known as epsom salts and is used in medicine, as are the oxide (magnesia), the carbonates and citrate. Magnalium is a light, hard alloy with aluminum.
Manganese. Symbol Mn. At. wt. 54.93. Valence II., III., IV., VI. and VII. S. G. 7.3. M. P. 1120°. B. P. 1900°.	Occ.—as pyrolusite (MnO_2), beaunite (Mn_2O_3), hausmannite (Mn_3O_4) and manganese spar ($MnCO_3$). Prep.—by heating Mn_3O_4 with aluminum filings. Prop.—a steel-gray, hard, brittle metal with a pinkish tinge. It rusts in moist air and is attacked by dilute acids.	Ferromanganese and spiegeleisen are alloys with iron, used in steel making. With copper it forms the hard, tough manganese bronzes, with tensile strength up to 30 tons per square inch. Impure sodium permanganate ($NaMnO_4$) is used in disinfecting as Condy's fluid.
Mercury. Symbol Hg. At. wt. 200.6. Valence I. and II. S. G. 13.6. M. P. —39.5°. B. P. 356.95°.	Occ.—free and as cinnabar (HgS). Prep.—by roasting cinnabar $HgS + O_2 — Hg + SO_2$. Prop.—a silver-white, mobile liquid with a vapor pressure at 0° of 0.0002 mm. It tarnishes but slowly in air and is attacked only by dilute nitric among the dilute acids. The vapor is monatomic.	It is used for filling thermometers and barometers. Its alloys are called amalgams, some of which are used in dentistry. Calomel (HgCl) is administered internally in medicine; corrosive sublimate ($HgCl_2$) forms a solution with very powerful germicidal properties.
Molybdenum. Symbol Mo. At. wt. 96.0. Valence III., IV., V. and VI. S. G. 10.0. M. P. 2450°.	Occ.—as molybdenite (MoS_2) and wulfenite ($PbMoO_4$). Prep.—by reducing the oxides with aluminum powder. Prop.—a white metal, as malleable as iron, that will not scratch glass. Insoluble in hydrochloric or dilute sulphuric acid.	The ferromolybdenum alloys are used in the manufacture of special steels.
Neodymium. Symbol Nd. At. wt. 144.3. Valence III. and IV. S. G. 7.0. M. P. 840°.	Occ.—with cerium and lanthanum. Prep.—by electrolysis of the fused chloride. Prop.—a yellowish metal, tarnishing in air.	The salts are rose-violet in color, and their solutions show characteristic absorption spectra.
Neon. Symbol Ne. At. wt. 20.2. Valence 0. B. P. ca. —243°.	Occ.—in minute quantity in the atmosphere. Prep.—neon and helium are boiled out of crude argon, and the neon separated from helium by cooling with liquid hydrogen. Prop.—a colorless, transparent, odorless, inert gas, resembling argon.	It forms no compounds, and is recognized by its characteristic spectrum.
Nickel. Symbol Ni. At. wt. 58.68. Valence II. and III. S. G. 8.8. M. P. ca. 1452°. B. P. ca. 2600°.	Occ.—as nicollite (NiAs) and nickel glance (NiAsS). Prep.—by igniting the oxalate in hydrogen. Prop.—a white, very hard, lustrous metal, malleable, ductile and tenacious. It rusts but slowly in air, and is attacked easily by only nitric acid.	The metal furnishes a protective coating when plated on iron. German silver is an alloy of nickel, copper and zinc. Nickel steel is used for armor plates. Manganin, containing nickel, copper and manganese, is used for electrical resistances.
Nitrogen. Symbol N. At. wt. 14.01. Valence III. and V. S. G. (liquid at B.P.) 0.81. M. P. —214°. B. P. —194°.	Occ.—free nitrogen forms about four-fifths of air by volume. As Bengal saltpeter (KNO_3), Chili saltpeter ($NaNO_3$); and as an essential constituent of vegetable and animal protoplasm. Prep.—by heating ammonium nitrite, by oxidation of ammonia, etc. Prop.—a colorless, odorless, transparent gas, rather inactive chemically. At ordinary temperature and pressure, 100 volumes of water dissolve 1.5 volumes of nitrogen. It unites directly with strongly heated boron, lithium, calcium and magnesium.	Nitrous oxide (N_2O), or laughing gas, is used by dentists. Nitric acid (HNO_3) has many applications in technical chemistry. Ammonia (NH_3) is a very soluble gas. Ammonium sulphate [$(NH_4)_2SO_4$] and Chili saltpeter are used as nitrogenous manures. Nitrogen is a constituent of the aniline dyes, the proteins and many other important classes of organic substances.
Osmium. Symbol Os. At. wt. 190.9. Valence II., III., IV., VI. and VIII. S. G. 22.477. M. P. 2500°.	Occ.—along with platinum. Prep.—by reducing OsO_4. Prop.—a gray metal, harder than glass, the heaviest of known bodies.	Its alloy with iridium is used in tipping gold pens. Osmium tetroxide (OsO_4) is used as a microscopic stain for fat.
Oxygen. Symbol O. At. wt. 16.00. Valence II. S. G. (liquid at B.P.) 1.13. M. P. —218.4°. B. P. —182.5°.	Occ.—free oxygen forms about one-fifth of air by volume. Water contains 88.88% of oxygen. The rocks of the earth's crust contain about 45% in combination, chiefly as silicates. Prep.—in the laboratory by heating potassium chlorate ($KClO_3$). Commercially, from the air. Prop.—a colorless, odorless, tasteless, transparent gas, slightly heavier than air. At ordinary temperature and pressure, 100 volumes of water dissolve 3 volumes of oxygen. It is very active chemically, combining directly with all but a few of the other elements to form oxides. Sulphur, phosphorus, etc., burn much more vigorously in oxygen than in air. Liquid oxygen is magnetic.	The gas is sold compressed in mild steel cylinders, and is used for the oxyhydrogen blowpipe and in medicine, besides for chemical purposes. It is necessary to support animal respiration and to sustain ordinary combustion. It enters as a constituent into all oxides, most salts and many organic compounds.

TABLE OF ALL THE KNOWN CHEMICAL ELEMENTS—Continued

Name and Important Data	Occurrence, Preparation and Properties	Compounds and Chief Uses
Palladium. Symbol Pd. At. wt. 106.7. Valence II. and IV. S. G. 11.9. M. P. 1549°.	Occ.—along with platinum, and with gold in Brazil. Prep.—by a complex series of processes from platinum ores. Prop.—a silvery, malleable and ductile metal, related to platinum, unlike which, however, it is attacked by nitric acid. Under suitable conditions it can take up over 900 volumes of hydrogen.	Since it does not tarnish, it is used for coating silver goods, and by dentists as a substitute for gold.
Phosphorus. Symbol P. At. wt. 31.04. Valence III. and V. S. G. white, 1.82. red, 2.25. M. P. white, 44°. B. P. 289°.	Occ.—as phosphates, such as apatite [$Ca_5F(PO_4)_3$]; in bones, teeth, brain and seeds of plants. Prep.—by reduction of calcium phosphate by carbon in the electric furnace in presence of a suitable flux. Prop.—phosphorus exists in two allotropic modifications: white phosphorus is waxy in consistency, soluble in carbon bisulphide, evil smelling and poisonous; red phosphorus is a solid, insoluble in carbon bisulphide, odorless and not poisonous. White phosphorus has a low ignition temperature, hence its former use in matches.	Red phosphorus is used in the manufacture of matches, as also is the compound P_4S_3. In the form of superphosphate of lime [$CaH_4(PO_4)_2$] phosphorus is an important artificial manure. The chlorides (PCl_3 and PCl_5) are much used in organic chemistry.
Platinum. Symbol Pt. At. wt. 195.2. Valence II. and IV. S. G. 21.48. M. P. 1753°.	Occ.—free, alloyed with the platinum metals, as nuggets in alluvial sands in the Urals, California, etc. Prep.—it is freed from the metals with which it is alloyed by a complex series of processes. Prop.—a silvery, tenacious, ductile and malleable metal, unaltered in moist air and unattacked by any single common acid. Aqua regia, fused alkalies, alkali nitrates and cyanides attack it, however. Platinum "sponge" and "black" are finely divided forms.	On account of its resistance to acids, platinum is much used for chemical vessels. Since platinum has a coefficient of expansion very close to that of glass, platinum wires can be fused through glass without danger of breakage on cooling. The salts are used in photography.
Potassium. Symbol K. At. wt. 39.10. Valence I. S. G. 0.86. M. P. 62.5°. B. P. 762°.	Occ.—as sylvite (KCl), carnallite ($KCl,MgCl_2,6H_2O$); in plant and animal ashes, and in many complex silicates. Prep.—by reduction or by electrolysis of fused potassium hydroxide (KOH). Prop.—a silver-white, lustrous metal, as soft as wax, tarnishing instantly in moist air. Chemically it is a very active metal, decomposing water in the cold and uniting violently with the halogens, sulphur and oxygen.	An alloy with sodium is used in filling high-temperature thermometers. Bengal saltpeter is the nitrate and is used in pyrotechny, for gunpowder and as a preservative. The iodide (KI) is used in medicine. The chlorate, like the nitrate, is used as a source of oxygen in pyrotechny and for match heads. Caustic potash (KOH) has many chemical applications The cyanide (KCN) is used in gold extraction.
Praseodymium. Symbol Pr. At. Wt. 140.9. Valence III. and IV. S. G. 6.47. M. P. 940°.	Occ.—with cerium and lanthanum. Prep.—by electrolysis of the fused chloride. Prop.—a yellowish metal, remaining untarnished in air.	The salts are leek-green in color, and their solutions have characteristic absorption spectra.
Radium. Symbol Ra. At. wt. 226.0. Valence II. M. P. 700°.	Occ.—in minute quantity in pitchblende and other uranium minerals. Prep.—the metal has recently been isolated; the bromide is separated from the barium bromide prepared from pitchblende by fractional crystallization. Prop.—in all of its compounds, the metal has the power of emitting certain radiations. These can pass through matter that is opaque to light, render air a conductor, affect a photographic plate and cause a zinc-sulphide screen to fluoresce visibly.	The rays from radium compounds (such as $RaBr_2$, $RaCl_2$, $RaCO_3$) act destructively on living tissues and on bacteria. One gram of radium in any of its compounds gives off about 100 calories of heat per hour.
Rhodium. Symbol Rh. At. wt. 102.9. Valence II., III. and IV. S. G. 12.1. M. P. 1970°.	Occ.—in the ores of platinum. Prep.—by a complex series of processes from platinum ores. Prop.—a silvery, malleable and ductile metal, not tarnishing in air and not attacked by aqua regia.	The red chloride ($RhCl_3$) is formed by the action of chlorine upon the metal.
Rubidium. Symbol Rb. At. wt. 85.45. Valence I., III. and V. S. G. 1.53. M. P. 38.5°. B. P. 69.8°.	Occ.—the salts are associated with salts of potassium. Prep.—similar to that of potassium. Prop.—a silver-white metal resembling potassium, like which it attacks water vigorously.	The compounds show characteristic flame-spectra, and were recognized as those of a new element spectroscopically by Bunsen.
Ruthenium. Symbol Ru. At. wt. 101.7. Valence III., IV., VI., VII. and VIII. S. G. 12.1. M. P. above 1950°.	Occ.—in the ores of platinum. Prep.—by a complex series of processes from platinum ores. Prop.—a hard, white, brittle metal, oxidized when heated in air, scarcely attacked by aqua regia.	The following oxides are known: Ru_2O_3, RuO_2, RuO_4, as well as salts corresponding to RuO_3 and Ru_2O_7.

TABLE OF ALL THE KNOWN CHEMICAL ELEMENTS—Continued

Name and Important Data	Occurrence, Preparation and Properties	Compounds and Chief Uses
Samarium. Symbol Sa. At. wt. 150.4. Valence II. and III. S. G. ca. 7.7. M. P. 1300 to 1400°.	Occ.—in the mineral samarskite. Prep.—by electrolysis of the chloride. Prop.—a whitish-gray metal, tarnishing in air.	The salts are topaz-yellow in color, and are similar to those of lanthanum.
Scandium. Symbol Sc. At. wt. 44.1. Valence III.	Occ.—in the minerals euxenite and gadolinite. Prep.—the metal has not been isolated. Prop.—the existence of this element, whose oxide was discovered in 1879, was predicted by Mendeléeff in 1869.	The chloride ($ScCl_3$) shows a characteristic spark spectrum.
Selenium. Symbol Se. At. wt. 79.2. Valence II., IV. and VI. S. G. amorphous 4.26. monoclinic 4.47. hexagonal 4.8. M. P. amorphous 50°. monoclinic 170 to 180°. hexagonal 217°. B. P. 688°.	Occ.—free in some specimens of sulphur, and in combination with lead, iron and other metals, as in pyrites. Prep.—(amorphous) by reducing selenious acid (H_2SiO_3) by sulphur dioxide. Prop.—three varieties are known: (1) red amorphous, soluble in carbon bisulphide, from which it is deposited as (2) red translucent monoclinic crystals, soluble in carbon bisulphide, (3) blue-gray metallic selenium, insoluble in carbon bisulphide. This last form conducts electricity many times better when exposed to light, and the better the brighter the light.	Selenium cells are used as indicators of intensity of illumination. The compounds strongly resemble those of sulphur. Hydrogen selenide is an evil-smelling inflammable gas. Selenic acid (H_2SeO_4) is a more powerful oxidizer than sulphuric acid and dissolves gold.
Silicon. Symbol Si. At. wt. 28.3. Valence IV. S. G. amorphous 2.3. crystalline 2.34. M. P. 1458°. B. P. ca. 3500°.	Occ.—silicon dioxide (SiO_2) occurs as flint, quartz, quartz sand, etc. The igneous rocks are composed largely of silicates, and this element constitutes over 25% of the earth's crust. Prep.—by reducing sand with coke in the electric furnace. Prop.—amorphous silicon is a brown powder that burns when heated in air. Crystalline silicon forms black needles. It is less active than the amorphous variety and is attacked only slowly by a mixture of hydrofluoric and nitric acids. It unites with fluorine, however, at ordinary temperatures.	The "pigs" of silicon made at Niagara are used in steel-making. The ornamental varieties of quartz find uses as gemstones, as do several natural silicates. Silicon carbide, "carborundum" (SiC), is used as an abrasive. Sodium silicate solution is "water glass," used to protect sandstone and to preserve eggs. Common glass is a mixture of sodium and calcium silicates.
Silver. Symbol Ag. At. wt. 107.88. Valence I. S. G. 10.53. M. P. 960°. B. P. 1955°.	Occ.—native, as sulphide (Ag_2S) often associated with galena; chloride ($AgCl$), etc. Prep.—from lead by the Pattison or the Parkes process; from the ores by the Mexican and other processes. Prop.—a white, highly lustrous, tough, very ductile and malleable metal, the best conductor of heat and electricity known. Liquid silver dissolves oxygen. It is unaffected by the oxygen of moist air, and its tarnishing is due to the action of hydrogen sulphide. It dissolves in dilute nitric and in concentrated hot sulphuric acid.	It is employed for articles of use and of ornament and for coinage. U. S. sterling silver contains 90% silver with 10% copper. Lunar caustic is silver nitrate. This salt and the halides of silver are extensively used in photography. For electroplating, a bath of potassium argenticyanide [$KAg(CN)_2$] is used.
Sodium. Symbol Na. At. wt. 23.00. Valence I. S. G. 0.97. M. P. 965°. B. P. 883°.	Occ.—in the sea as chloride ($NaCl$); in salt deposits as chloride, borate, nitrate; in many complex silicates in rocks. Prep.—by electrolysis of fused sodium hydroxide ($NaOH$). Prop.—a silver-white metal, as soft as wax, that may be welded at ordinary temperature. Like potassium it is very active, uniting directly with many other elements, and attacking water vigorously in the cold.	The metal is used in the manufacture of several chemicals. Sodium chloride ($NaCl$) is a necessity of life to most animals; and is used in the manufacture of hydrochloric acid, chlorine and sodium compounds. Sodium carbonate ($Na_2CO_3,10H_2O$) or washing soda, and sodium hydroxide ($NaOH$) are used for cleaning, and in the manufacture of soap and chemicals. Baking soda is sodium bicarbonate ($NaHCO_3$). The sulphate (Na_2SO_4, $10H_2O$) is known as Glauber's salt; the thiosulphate, by photographers, as "hypo."
Strontium. Symbol Sr. At. wt. 87.63. Valence II. S. G. 2.55. M. P. ca. 800°.	Occ.—as strontianite ($SrCO_3$) and celestine ($SrSO_4$). Prep.—by electrolysis of the fused chloride. Prop.—a white metal, softer than calcium and harder than sodium, tarnishing to a yellow tint. Like calcium, it is active enough to attack water vigorously in the cold.	The nitrate and chlorate are used in pyrotechny for red fire. All volatile compounds color the Bunsen flame red.
Sulphur. Symbol S. At. wt. 32.06. Valence II., IV. and VI. S. G. rhombic 2.06. monoclinic 1.96. M. P. rhombic 112.4°. monoclinic 119°. B. P. 444.9°.	Occ.—native, in combination with most metals as sulphides, and with some metals as sulphates. Prep.—by melting the free sulphur away from the rocky matrix, and subsequent purification by distillation. Prop.—natural sulphur is rhombic in crystalline form, yellow, brittle, of vitreous luster, and a poor conductor of heat and electricity. This and the monoclinic variety are soluble in carbon bisulphide, while amorphous sulphur is not. When heated, sulphur unites directly with most of the other elements.	Sulphur is used to prepare sulphur dioxide (SO_2), which is used in making sulphuric acid and sulphites, and for bleaching; also for vulcanizing rubber and in the manufacture of black gunpowder, fireworks and matches. Sulphuric acid (H_2SO_4) is to chemical industry what iron is to engineering.

TABLE OF ALL THE KNOWN CHEMICAL ELEMENTS—Continued

Name and Important Data	Occurrence, Preparation and Properties	Compounds and Chief Uses
Tantalum. Symbol Ta. At. wt. 181.5. Valence II., IV. and V. S. G. 16.6. M. P. bet. 2250° and 2300°.	Occ.—in tantalite and many other rare minerals. Prep.—by the action of sodium on sodium tantalofluoride (Na_2TaF_7). Prop.—a hard, silver-white metal, ductile and malleable when hot, of very high tensile strength. The hot metal can absorb 740 volumes of hydrogen. It is not attacked by aqua regia.	The metal is used for filaments for electric lamps, which possess twice the efficiency of the carbon filament lamp.
Tellurium. Symbol Te. At. wt. 127.5. Valence II., IV. and VI. S. G. cryst. 6.2. M. P. cryst. 455°. B. P. 1400°.	Occ.—free and as tellurides. Prep.—by reducing tellurious acid (H_2TeO_3) by means of sulphur dioxide. Prop.—the crystalline variety is white, has metallic luster, and conducts heat and electricity. The precipitated variety is black and of lower density. The element is related to sulphur but is more metallic in character.	The compounds find few applications Telluric acid (H_6TeO_6) has basic as well as acid characters, in keeping with the position of the element between metals and nonmetals.
Terbium. Symbol Tb. At. wt. 159.2. Valence III.	Occ.—in gadolinite, samarskite, and other rare minerals. Prep.—the metal has not been prepared.	The salts show no absorption spectrum.
Thallium. Symbol Tl. At. wt. 204.0. Valence I., and II. S. G. 11.8. M. P. 303. B. P. 1515°.	Occ.—in crookesite, and in small quantities in many samples of iron pyrites. Prep.—it is precipitated by zinc from a solution obtained by suitable treatment of the flue dust from sulphuric acid works. Prop.—a bluish-white, lead-like metal, rather soft, malleable, but of low tensile strength. It decomposes water rapidly at red heat, and dissolves in dilute acids.	It forms two sets of salts, the thallous (e.g., TlCl) and the thallic (e.g., $TlCl_3$). All the compounds show a characteristic green line in the spectrum.
Thorium. Symbol Th. At. wt. 232.4. Valence IV. S. G. 11.0. M. P. above 1700°.	Occ.—in monazite sand. Prep.—by reducing potassium thorium chloride with sodium, or by electrolysis of the chloride in a mixture of fused potassium and sodium chlorides.	The nitrate [$Th(NO_3)_4,6H_2O$] is used in making Welsbach incandescent mantles, which consist of 99% of ThO_2. All the compounds are radio-active.
Thullium. Symbol Tm. At. wt. 168.5. Valence III. M. P. 1700°.	Occ.—in gadolinite and other yttrium minerals. Prop.—a metal with the color of nickel, that can be burnt in air. Hydrochloric acid attacks it but slowly.	The salts are of a pale bluish color which is destroyed very easily by minute quantities of erbium.
Tin. Symbol Sn. At. wt. 118.7. Valence II. and IV. S. G. white 7.3. gray 5.7. M. P. 231.8°. B. P. 2275°.	Occ.—as cassiterite (SnO_2). Prep.—after roasting, the ore is reduced by heating with carbon. Prop.—a silver-white, rather soft, very malleable and ductile metal, practically unchanged in air. When heated, it may be burned in air. Dilute nitric acid is the only dilute acid that attacks it rapidly. When kept long at temperatures below zero Centigrade, ordinary tin changes to a brittle, gray, powdery modification. This form is the stable one below 20°.	Large quantities of tin are used in the tinning of iron for tinplate. It is a constituent of the alloys Britannia metal, pewter, solder, bronze, etc. Tin forms two sets of salts, stannous (e.g., $SnCl_2$) and stannic (e.g., $SnCl_4$). "Pink salt" [$(NH_4)_2SnCl_6$] is used in dye. "Mosaic gold" is SnS_2.
Titanium. Symbol Ti. At. wt. 48.1. Valence II., III. and IV. S. G. 4.5. M. P. below 1850°.	Occ.—as rutile (TiO_2) and in titanic iron ore ($FeTiO_3$). Prep.—by reducing the chloride ($TiCl_4$) by means of sodium. Prop.—a hard, brittle metal, resembling polished steel in appearance, that may be forged at a low red heat. It dissolves in dilute sulphuric acid, and decomposes steam at 800°. It unites easily with nitrogen.	The element is very widely disseminated, though in small quantity. It is contained in the ashes of all plants.
Tungsten. Symbol W. At. wt. 184.0. Valence II., IV., V. and VI. S. G. 19.3. M. P. 3177°. B. P. ca. 3700°.	Occ.—as wolfram ($FeWO_4$) and as scheelite ($CaWO_4$). Prep.—by reducing tungstic acid (H_2WO_4) by carbon at a high temperature. Prop.—a hard, brittle, gray metal, attacked by chlorine only at 250°, although it can be caused to burn in air. It is slowly acted upon by dilute acids and even by water.	The metal is used for the filaments of incandescent electric lamps, giving an efficiency of 1.3 watts per candle power. Tungsten steel has 5% W. Sodium tungstates are used as mordants in dyeing.
Uranium. Symbol U. At. wt. 238.2. Valence III., IV., V. and VIII. S. G. 18.7. M. P. ca. 1500°.	Occ.—as pitchblende, which contains U_3O_8. Prep.—by reducing the oxides with aluminum. Prop.—a white, lustrous metal, tarnishing in air and attacking water slowly in the cold. It combines directly with many of the other elements	All the compounds of uranium are radioactive in proportion to their uranium content. Glass to which uranium compounds have been added shows a greenish-yellow fluorescence.
Vanadium. Symbol V. At. wt. 51.0. Valence II., III., IV. and V. S. G. 5.7. M. P. ca. 1715°.	Occ.—in a few rather rare minerals. Prep.—by reduction of the dichloride (VCl_2) in hydrogen. Prop.—a silver-white, lustrous metal, harder than quartz. It does not tarnish nor attack water at ordinary temperatures, but can be burnt in oxygen.	Vanadium added to steel in even small quantity (0.2%) increases the tenacity and elastic limit without reducing the ductility.

TABLE OF ALL THE KNOWN CHEMICAL ELEMENTS—Continued

Name and Important Data	Occurrence, Preparation and Properties	Compounds and Chief Uses
Xenon. Symbol Xe. At. wt. 130.2. Valence 0. B. P. 109°. S. G. (liquid at B.P.) 3.82.	Occ.—in minute quantity in the air, less than one volume in 100 million. Prep.—by fractionation of liquid argon. Prop.—a transparent, colorless and odorless gas, very inert like its congener argon. It is the densest of the argon family.	It forms no compounds.
Ytterbium (Neoytterbium). Symbol Yb. At. wt. 173.5. Valence III.	Occ.—in gadolinite, euxenite and other rare minerals. Prep.—the metal has not been isolated.	The compounds show a characteristic spark spectrum.
Yttrium. Symbol Y. At. wt. 88.9. Valence III. S. G. 3.8.	Occ.—in gadolinite, euxenite and other rare minerals. Prep.—by electrolysis of sodium yttrium chloride. Prop.—a gray, lustrous metal.	The chloride yields a characteristic, though complex, spectrum.
Zinc. Symbol Zn. At. wt. 65.37. Valence II. S. G. 6.9 to 7.2. M. P. 419.3°. B. P. 906°.	Occ.—as zinc blende (ZnS), calamine ($ZnCO_3$), zincite (ZnO), etc. Prep.—after roasting, the ore is reduced by coal, the metal distilling off. Prop.—a bluish-white, lustrous, brittle metal, that is malleable and ductile at 120°. It tarnishes in moist air, attacking water slowly in the cold and rapidly when heated in steam. It dissolves in dilute acids and in sodium hydroxide solution.	Sheet zinc is used for roofs and gutters. Iron is galvanized by dipping it in molten zinc, and so protected from rusting. Zinc is used for galvanic batteries and, alloyed with copper, to make brass. The salts are used in medicine; the chloride and sulphate antiseptic solutions.
Zirconium. Symbol Zr. At. wt. 90.6. Valence IV. S. G. 6.4.	Occ.—as zircon ($ZrSiO_4$). Prep.—by reducing the oxide (ZrO_2) with carbon in the electric furnace. Prop.—a hard, gray metal, remaining bright in air and only slowly oxidized at a white heat. It is dissolved by aqua regia and by caustic potash solution.	The oxide is contained in some incandescent gas mantles.

CHEMISTRY OF THINGS FAMILIAR

What is Starch?—How Manufactured?—Composition of Wheat Flour—Acids—Alkalies—Sulphuric, Nitric, and Muriatic Acids—Sulphuretted Hydrogen—Tanning of Hides to Form Leather—Vinegar—Alcohol—Yeast—Fruit, How Preserved—Decay in Wood—What is Ether?—Disinfecting Agents—How Smoking Preserves Meat—What is Albumen?—What is a Poison?—Arsenic—Certainty of its Detection—Lead Pipes, How Poison Water—Verdigris—Calomel—Preservation of Wood—Common Names of Chemicals

What is starch?

The name starch is given to a *mealy substance* which is deposited in *most vegetables* at the time of ripening, from the juices with which the cells of the plants are filled.

What common vegetable especially abounds in starch?

The *potato,* which consists entirely of cells filled with starch and water.

A cell is a little membranous bladder filled with a solid or fluid substance.

Why does a laundress find it necessary to boil starch before using it for stiffening linen, etc.?

The starch, consisting of little granules, is *insoluble in cold water;* but when acted upon by hot water, the granules burst and allow their contents, which are soluble, to become mingled with the water.

Starch is manufactured as follows:—

Potatoes, for example, from which most of the starch of commerce is manufactured, after being pared, are grated to a pulp. This pulp is put upon a sieve and stirred about, while at the same time a little stream of water is made to flow upon it. A milky liquid runs through the sieve, but the fibrous portion of the potato, the vegetable tissue, remains behind. This liquid, after a short interval, deposits a white powder, which is the starch. By the simple process of tearing up the vegetable tissue, and removing the inclosed starch by washing, this substance may be procured from a great variety of plants.

Why do potatoes, beans, rice, and most of the common vegetables, swell up when boiled with water?

Because the *starch absorbs water* at the boiling temperature, which causes the *cells to swell,* thereby giving to the vegetable a rounded appearance.

What is the composition of wheat flour?

Starch is one of the *principal constituents* of wheat flour, as well as of all other kinds of meal. The other principal constituent is a gray, tough, viscous substance, called *gluten.*

To what does paste, made of wheat or rye flour, owe its adhesiveness?

In some measure to the *starch,* but principally to the *gluten* contained in it.

Can starch be converted into gum and sugar?

It *can; fruits and plants effect this change naturally:* we can also produce the change artificially by chemical processes.

Why are potatoes frozen and thawed sweet?

Because by the *freezing action* the starch of the potato is in part *converted into sugar.*

Why are apples, pears, grapes, etc., in their unripe state sour, and in their ripe condition sweet?

In the unripe fruits mentioned *starch is present;* in the ripe fruits it is *absent;* in the process of ripening the starch is *converted into sugar,* and the fruit becomes sweet.

What are acids?

Acids are substances which excite the *taste of sourness* when applied to the tongue; they change the *blue juices* of vegetables to *red,* and combine with alkalies to form neutral compounds.

What is an alkali?

An *alkali* is a body that possesses properties the *converse of those of an acid.* It has a *highly bitter, acrid taste,* changes the *blue juices* of vegetables to *green,* or the juices of vegetables which have been changed red by an acid, back again to blue. Potash and soda are the representatives of the alkalies.

When sulphur is burned in the air what is the product formed?

Sulphurous acid.

What causes the suffocating odor of a lighted brimstone match?

The *sulphurous acid* generated by the combustion of the sulphur.

What is sulphuric acid or oil of vitriol?

It is a compound of *sulphur and oxygen,* containing one-third more oxygen than sulphurous acid.

What is sulphuretted hydrogen?

A *gas* formed by the union of *sulphur and hydrogen.* It possesses an offensive odor, and is very poisonous.

How is sulphuretted hydrogen formed in nature?

Principally from the *decomposition of animal substances,* as blood, flesh, hair, etc.

Why does the yolk of an egg tarnish a silver spoon?

Because it contains a *little sulphur,* which, at the temperature of an egg just boiled, will decompose the water or moisture upon the spoon, and produce *sulphuretted hydrogen gas,* which will tarnish silver.

Both the white and the yolk contain sulphur, but the latter the most abundantly.

What is it that makes an open or foul sewer so destructive of health to any district in which it may be situated?

The evolution of *sulphuretted hydrogen.* When inhaled, it acts directly upon the blood, thickening it, and turning it black.

Why do surfaces painted with lead paints, in the vicinity of sewers, soon turn black, or become discolored?

Through the action of *sulphuretted hydrogen.*

What is nitric acid?

Nitric acid, or aqua-fortis, is a compound of five parts of oxygen and one of nitrogen.

It is *liquid;* when pure, *colorless,* and highly *corrosive;* it attacks almost all dead, unorganized substances, and destroys living tissues.

What is muriatic, or, more properly, hydrochloric acid?

A compound of *hydrogen and chlorine* usually prepared from salt. It is an acid much used in the arts.

What is "lunar caustic"?

A compound of *nitric acid* and *oxide of silver.*

Why, when lunar caustic is applied to the flesh, does it burn and destroy it?

Through the agency of the *nitric acid* contained in it.

Do plants produce acids?

Acids are formed in the *vegetable kingdom* in *great abundance;* they especially exist in unripe fruits, imparting to them a sour taste.

Acids formed from mineral substances are called "mineral acids"; acids formed by or from vegetable substances are called "organic acids."

Why does tanning hides convert them into leather?

Hides are steeped in water, with ground bark of the oak, hemlock, or other trees; these barks contain large quantities of *tannic acid,* which combine with the skin of animals, and form a combination which is insoluble in water and not subject to putrefaction—viz., leather.

What is ordinary vinegar?

An *acid,* called *acetic acid,* and water.

If wine or beer be imperfectly corked, why does it rapidly turn sour?

Because air gets into the liquor, and the oxygen of the air combining with the alcohol of the liquor produces acetic acid, or *vinegar.*

What is alcohol?

Alcohol is the *spirit* existing in wine, beer, cider, etc., *obtained in the process of fermentation.*

What is a ferment?

A ferment is a substance containing *nitrogen* in a state of *decomposition,* which is able to excite fermentation in solutions of sugar; old cheese, putrefying flesh, blood, etc., all of them are ferments.

What is yeast?

We apply the term yeast to a particular species of ferment; the *foam of beer* (or of some similar liquor), produced by *fermentation.*

Can you explain why it is that a body in a state of fermentation or putrefaction should cause unlimited quantities of similar matter to pass into the same state?

We only *know the fact:* the reason we are *ignorant of.* The most minute portion of milk, paste, juice of grapes, flesh, or blood, in a state of fermentation or putrefaction, causes fresh milk, paste, grape juice, flesh, or blood, to pass into the same condition, when in contact with them.

In storing or packing fruit for future use why is it necessary to carefully remove every decayed specimen?

Because the decayed portions of one specimen will quickly *communicate decay to the fresh fruit in contact* with it, and soon the whole mass of fruit will become putrescent.

If in a vessel, or any other structure, one timber becomes decayed what course ought to be adopted?

It should be removed *immediately,* or the decomposition once commenced will in time affect the whole structure.

It sometimes happens that physicians, in dissection, are seriously poisoned by the slightest cut of a knife which has been used upon the dead body. The knife introduces to the healthy blood, through the wound, a *minute portion of matter in the state of decomposition or putrefaction.* This acts as a *ferment,* and causes the healthy matter in contact with it to pass into the same decomposed state. The action once commenced rapidly extends, until the whole body becomes affected, and death ensues. It is almost impossible to heal wounds of this character.

Why is it especially dangerous to eat fruit or meats partially decayed?

Because the *decayed portions* of the substance eaten are liable to induce the *same condition* in the healthy organs of the stomach with which they may come in contact.

Why do fruit preserves frequently turn sour?

Because, owing to the action of some fermenting substance present either in the fruits themselves or in the air, the sugar used in preserving is *converted into alcohol,* and the alcohol into vinegar.

Why does the housewife scald her preserved fruits to prevent their turning sour?

Because fermenting substances and fermenting action are *destroyed* by a boiling temperature.

Why do we keep preserves, beer, cider, or other substances liable to turn sour, in a cool place?

Because a depression of temperature *arrests fermentation,* though it does not prevent its renewal when the temperature in increased.

What is ether?

Ether is a product obtained by *distilling strong alcohol* and *sulphuric acid.* The product is called sulphuric ether, but it does not contain sulphuric acid, nor has it any sulphur in its composition.

What are the properties of ether?

It is an *exceedingly volatile, inflammable* body, producing insensibility when inhaled, and readily dissolving all fatty and oily bodies.

Why will ether remove spots of oil, paint, or grease from garments?

Because it is a *solvent* for all greasy, oily matters.

What are the best agents for depriving putrid and decaying animal and vegetable substances of their offensive odors?

Chloride of lime is the most effectual agent; and *chloride of zinc* and *sulphate of iron* (green vitriol) are also exceedingly efficient. On a large scale, as in the sanatory cleansing of towns, pulverized charcoal, burnt clay, and quicklime are to be recommended.

What effect does the use of perfumes or the burning of pastiles have upon offensive odors?

They merely *disguise* the odor, but do *not remove or destroy it.*

By adopting what precautions may a person safely enter sick rooms, or visit, without risk, the most dangerous receptacles of filth?

By moistening a linen cloth with vinegar, and sprinkling over it finely-powdered chloride of lime.

Air breathed through this, applied to the mouth and nostrils, will enter the lungs charged with a minute quantity of chlorine, which will effectually destroy any noxious vapors or miasms that escape from diseased bodies, or from decaying animal and vegetable substances.

What three conditions are requisite to produce putrefaction in animal and vegetable substances?

It is necessary that they should be exposed to the combined influence of *air, heat,* and *moisture.*

Why is a substance preserved from decay by drying, or by the exclusion of air from it?

Because by so doing we *remove* the *moisture* and *air* essential to the process of decay.

Why does the smoking of fish or flesh contribute to their preservation?

Because the volatile matters of the smoke, such as creosote, pyroligneous acid, and the like, effect a species of *chemical combination* with the fiber of the meat, and with the substances contained in the natural juices of the flesh, which combinations are *less liable* to decay than the substances themselves.

What is albumen?

Albumen is an *animal substance* as well as *vegetable.* It exists most abundantly, and in its purest natural state, in the *white of an egg,* from whence it derives its name (*album ovi*), which is the Latin for the white of an egg.

The serum or fluid portion of the blood (which, after exposure to the air, is separated from the more solid part), the vitreous and crystalline humors of the eye, the brain, the spinal marrow, and nerves, all contain albumen.

What is the yolk of an egg?

This also consists of *albumen,* but contains in addition a *yellow oil,* which imparts to it its color.

Why is meat tough which has been boiled too long?

Because the *albumen* becomes hard, like the white of a hard-boiled egg.

The best way of boiling meat to make it tender is this: Put your joint in very brisk boiling water; after a few minutes add a little cold water. The boiling water will *fix* the albumen, which will prevent the water from soaking into the meat, keep all its juices in, and prevent the muscular fiber from contracting. The addition of cold water will secure the cooking of the *inside* of the meat, as well as of the surface.

Why is meat always tough if it be put into the boiler before the water boils?

Because the water is not hot enough to *coagulate* the albumen between the muscular fibers of the meat, which therefore runs into the water, and rises to the surface as scum.

Why is the flesh of old animals tough?

Because it contains *very little* albumen, and much muscular fiber.

What is a poison?

A poison is any agent capable of producing a dangerous effect upon anything endowed with life.

In cases of poisoning by substances taken into the stomach, what course should be pursued, in the absence of medical attendance?

The first step is to evacuate the stomach by means of powerful emetics, and when vomiting has taken place, warm water and the white of eggs may almost always be given with advantage.

Can poisons administered for criminal purposes be almost certainly detected?

They can; chemical science within the last few years has made such advances that the most minute quantities of all the best known poisons can be detected with certainty long after death.

There is no poison *so liable* and *certain* to be found as *arsenic,* and in almost every case of poisoning with mineral poisons, science is enabled to detect the substance, even when life has been extinct for years, and the body nearly decomposed.

What is arsenic?

Metallic arsenic is an *exceedingly brittle metal,* of a *steel-gray color.* It vaporizes, when heated, with a strong odor of garlic, a property not possessed by any other metal.

The substance used as poison, and sometimes known as ratsbane, is arsenious acid, a compound of arsenic and oxygen. Arsenious acid has the form and appearance of a fine white powder.

What is the best remedy in cases of poisoning with arsenic?

The *hydrated peroxide of iron* (iron rust) is considered the best remedy.

The following is the best method for preparing this substance: Take common copperas (sulphate of iron) four ounces; dissolve in warm water in a glass, or porcelain dish, and add a small quantity of sulphuric acid, and afterwards ammonia solution, so long as a dense red precipitate is formed. This precipitate carefully strained off, and thoroughly washed in a filter with water, is hydrated peroxide of iron. So long as kept moist, it may be preserved for a great length of time.

Is lead a poison?

Lead and nearly all its compounds are *dangerous* and *secret poisons;* when received into the system, it frequently remains dormant for years, and then suddenly manifests itself in various forms of disease.

What is the disease called "painter's colic"?

A disease to which painters and others *working in lead are liable,* in consequence of receiving into their system, imperceptibly, portions of lead.

Is it dangerous to sleep in, or breathe the air of, a room newly painted with paints containing lead?

It is *highly dangerous,* since the air is filled with a vapor of the lead compound used as paint.

Why are some waters, when conveyed through lead pipe, poisonous?

Waters which are *very pure* and contain *much oxygen* dissolved in them; waters which contain *nitric acid* compounds, such as those flowing from the vicinity of barn-yards, manure heaps, and those which contain *common salt* or *organic matter,* as water flowing from swamps and fields; waters containing soluble *carbonates* —all dissolve lead from the pipes through which they may be made to pass. Constant use of such waters, in the process of time, will introduce sufficient lead into the system to produce disease, which is often attributed to other causes.

What is verdigris?

Verdigris is a compound of copper, oxygen, and acetic acid. This, and all the compounds of copper, are *very poisonous.* The most efficacious antidotes for poisoning with copper are white of eggs and milk.

What is calomel?

It is a compound of *two parts of mercury* united to one of *chlorine*, forming the sub-chloride of mercury. The preparation, commonly known in medicine as "blue pill," is a preparation of calomel.

What is corrosive sublimate?

A compound of *mercury and chlorine* united in equal proportions, forming the perchloride of mercury.

Are both these compounds, calomel and corrosive sublimate, poisons?

They *are;* corrosive sublimate, especially, is a most *deadly poison.* In case of poisoning by it, the most effectual antidote is white of eggs.

What is the process of preserving wood from decay, commonly termed "kyanizing"?

It consists in *saturating* the fibers of the wood with a *solution of corrosive sublimate.*

Poisonous substances, and corrosive sublimate especially, have the property of protecting animal and vegetable substances from decay. The skins of stuffed birds and animals, and the plants of a herbarium, may be protected from insects and decay, by washing them with a solution of corrosive sublimate. It should not, however, be forgotten that these substances by such treatment become themselves poisonous.

Give a list of the chief antidotes for poisons.

(See Book of the Human Body.)

What are the common names of familiar chemical substances?

Common Names of Chemicals

Common Names	*Chemical Names and Formulæ*
Alum	Sulphate of Aluminum and Potassium
Aqua Fortis	Nitric Acid, HNO_3
Aqua Regia	Nitro-Hydrochloric Acid
Calomel	Mercurous Chloride, Hg_2Cl_2
Carbolic Acid	Phenol, C_6H_5OH
Caustic Potash	Potassium Hydrate, KOH
Caustic Soda	Sodium Hydrate, NaOH
Chalk	Calcium Carbonate, $CaCO_3$
Copperas	Sulphate of Iron
Corrosive Sublimate	Mercuric Chloride, $HgCl_2$
Cream of Tartar	Potassium Bitartrate
Epsom Salts	Magnesium Sulphate
Ether	Diethyl Oxide, $(C_2H_5)_2O$
Fire Damp	Light Carburetted Hydrogen
Galena	Lead Sulphide, PbS
Glauber's Salt	Sodium Sulphate
Glucose of Grape Sugar	Dextrose, $C_6H_{12}O_6$
Goulard Water	Basic Acetate of Lead
Iron Pyrites	Iron Di-Sulphide, FeS_2
Jewelers' Putty	Oxide of Tin
Laughing Gas	Nitrous Oxide, N_2O
Lime	Calcium Oxide, CaO
Lunar Caustic	Silver Nitrate, $AgNO_3$
Mosaic Gold	Bi-Sulphide of Tin
Muriatic Acid	Hydrochloric Acid, HCl
Olefiant Gas	Ethylene, C_2H_4
Plaster of Paris	Calcium Sulphate
Quartz	Silicon Dioxide, SiO_2
Realgar	Arsenic Di-Sulphide, As_2S_2
Red Lead	Oxide of Lead, Pb_3O_4
Rochelle Salt	Sodium Potassium Tartrate
Salammoniac	Ammonium Chloride
Salt, Common	Sodium Chloride, NaCl
Salt of Tartar	Potassium Carbonate
Saltpeter	Potassium Nitrate, KNO_3
Salts of Lemon	Oxalic Acid
Slaked Lime	Calcium Hydrate
Soda	Sodium Carbonate
Spelter	Zinc
Spirits of Hartshorn	Amm. Hydroxide, NH_4OH
Spirits of Salt	Hydrochloric Acid, HCl
Sugar of Lead	Lead Acetate
Tartar Emetic	Potass. Antimony Tartrate
Verdigris	Basic Copper Acetate
Vermilion	Sulphide of Mercury
Vinegar	Dilute Acetic Acid
Vitriol, Blue	Copper Sulphate
Vitriol, Green	Ferrous Sulphate
Vitriol, Oil of	Sulphuric Acid, H_2SO_4
Vitriol, White	Zinc Sulphate
Volatile Alkali	Ammonia

What is meant by radio-activity and radio-active substances?

Radio-activity is the phenomenon associated with substances which spontaneously emit rays of unique penetrating power through the escape of electrons and their striking against other substances. Chief of the radio-active substances are radium, polonium, actinium, thorium, etc.

What is the history of these substances?

Henri Becquerel in 1896 first observed this in the case of potassium uranyl sulphate, the rays from which he found affected a photographic plate through black paper, thin plates of metal, etc.; the property was further traced in other uranium salts and in uranium itself. These rays are known as *Becquerel rays,* and have the further power to render air a conductor of electricity, and thus to discharge any electrified substance placed near them.

A charged electroscope forms a test of radio-activity, and the rate at which the leaves fall measures the degree. Different uranium salts have different degrees of radio-activity; some varieties of pitchblende, as also chalcolite, show the property in excess of uranium contained.

Madame Curie, by using the activity test for every precipitate obtained from pitchblende, succeeded in discovering the elements *polonium* and *radium* in 1898. The next year Debierne discovered *actinium,* another radio-active element in the same substance. Meanwhile Schmidt and Madame Curie independently found that the same properties were associated with *thorium,* its compounds and the minerals containing it. In 1903 Ramsay and Soddy discovered that radium continuously produces helium, the lightest of the inactive gases discovered by Ramsay in 1896.

Twenty-eight elements are now classed in three divisions with the three parents, uranium, thorium, and actinium. Potassium and rubidium have been shown to be radio-active, but otherwise the alkaline metals do not enter the classes.

Describe radium and its special properties.

What It Is Like.—To the eye a tiny sample of radium—or, to speak more correctly, of one of the radium salts, for radium in a pure state (*i.e.* the metal) has not been obtained as yet—presents no very striking appearance. All one sees is a few tiny crystals, or perhaps a few specks of whitish-looking powder, glowing in the dark with a faint phosphorescent light similar to that sometimes emitted by a piece of decaying fish.

The Radiations are of three kinds, comparable with those of the vacuum tube: *Alpha*-rays are heavy particles, positively charged, similar to the canal rays; *Beta*-electrons, negative like cathode rays; *Gamma*-rays resemble Röntgen rays. They penetrate matter to different degrees, behave differently under the action of a magnetic field, but under ordinary circumstances travel in straight lines.

But rays from different elements vary in penetration, and also with the absorbing substance, varying roughly with the density.

The *Alpha*-rays have a velocity of from 1.56 $\times 10_9$ centimeters per second (radium) to 2.25 $\times 10_9$ centimeters per second (thorium); they are particles of helium carrying a double charge of electricity. *Beta*-rays have a greater range of velocity and approach that of light. Both

Alpha- and *Beta*-rays are absorbed by a thickness of one centimeter of lead, but *Gamma*-rays pass through an inch of lead; they carry no charge of electricity, yet ionize the air and discharge the electrometer.

All the rays on impinging on solid particles give rise to *secondary rays*, sometimes called *Delta*-rays, electrons moving with comparatively low velocity. The *Alpha*-rays possess ninety-five per cent of the energy evolved and produce brilliant fluorescence in zinc sulphide, diamond, etc., the other rays producing this best in willemite and the platino-cyanides; all become absorbed and transmuted into heat.

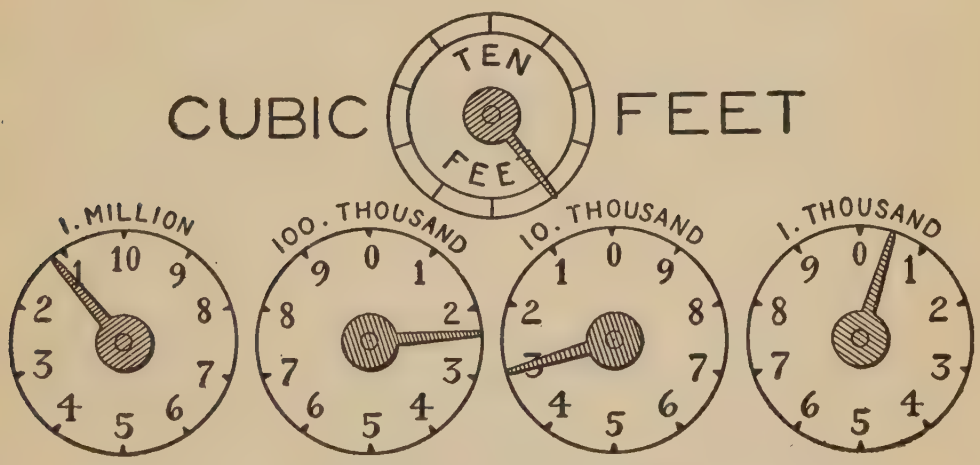
Radium every hour generates sufficient heat to raise its own weight of water from freezing to boiling point.

THE SPINTHARISCOPE.—This is a simple piece of apparatus invented by Sir William Crookes, by means of which some of the effects of the *Alpha*-ray particles can be observed in a very striking manner. In consists of a little screen covered with powdered zinc sulphide. A small fragment of radium is placed directly in front of the middle of the screen and in close proximity to it. On observing this screen in the dark through a suitable lens, scintillating little points of light are seen to be continually flashing into view and dying away. Each tiny spark is thought to be produced by the impact of a single *Alpha*-ray particle. That these particles or emanations must be matter in a state of extreme attenuation is proved by an experiment of Professor Curie's in which a box constructed of platinum was pierced with two holes so minute as to be capable of retaining a vacuum, and yet these radium emanations passed through quite freely.

What are the medical uses of radium?

Ulcerous growths, birth-marks, and scars are beneficially treated, but so far the selective action of radium on tissue has not been determined, nor its bactericidal effect. Its results in the treatment of cancer have not yet reached a definite stage, though it has been widely heralded as a specific for that dreadful malady.

The application of the rays is by various methods: inhalation of the emanation; external application or injection of the emanation condensed on glycerine, vaseline, oil, water, etc.; or the taking of quinine, arsenic, bismuth, etc., on which the emanation has been condensed. Injections of very dilute solutions of radium salts, or insoluble salts suspended in water, are made. But external applications of the rays are considered most important; copper plates or linen are coated with varnish containing the salts, or glass tubes contain them, and the radiations are directly applied, the surrounding parts being protected with lead foil.



GAS METER INDICATOR DIALS.

HOW TO READ A GAS METER

The dial marked "1 thousand" in the accompanying illustration is divided into hundreds; the dial marked "10 thousand" is divided into thousands; that marked "100 thousand" into ten-thousands, and that marked "1 million" into hundred-thousands. When 1,000 cubic feet of gas have been consumed, the pointer on the dial marked "1 thousand" will have made a complete rotation and the fact will be indicated by the pointer of the next dial at the left, which will point to the figure 1. When 10,000 cubic feet of gas have been consumed, the pointer on the "10 thousand" dial will point to 1, and so on. In reading a gas meter, put down the hundreds first, then the thousands, and so on, always counting the figure just under, or which has just been passed by, the pointer. In the illustration about half a hundred is indicated on the "1 thousand" dial, three thousands is indicated on the next dial, two ten-thousands on the next dial, and one one-hundred-thousand on the "1 million" dial. The reading will be 123,050. The dial marked "ten feet" is called the units dial. It is used for testing the meter to discover whether it is in working order or not. Each mark represents a cubic foot and the complete circle 10 cubic feet. If the pointer moves when no gas is burning, it indicates a leak. If it does not move when the gas is burning, or if its motion is unsteady, it indicates a derangement in the mechanism and shows that the meter requires attention.

OUTLINE COURSE OF ELEMEN-

Grades	LIFE		
	ZOOLOGY	BOTANY	MINERALOGY
I. II. III.	Observe— 1. Birds; migration, nesting, feeding. 2. Insects; butterflies, moths, earth-worms. 3. Uses of birds and insects.	Observe— 1. Flowers; color, form, parts. 2. Fruits; color, form, etc. 3. Leaves; shape, color, veining. 4. Stems; form, position, bark, structure. 5. Conditions of growth, habits, etc.	Observe 1. Pebbles and rocks; color, shape, hardness. 2. Kinds of rock; quartzose, calcites. 3. Uses; for soil making and building.
IV.	By observing the form and structure, determine some 1. Orders of mammals. 2. Orders of birds. 3. Orders of insects. 4. Orders of reptiles. Uses of animals.	Observe characteristics of— 1. Exogens and Endogens. 2. Kinds of trees, fruits, vegetables, grasses and grains. 3. Effects of cultivation.	1. Sandstone. 2. Argillaceous rocks. 3. Formation of rocks. *a*. Sedimentary; sandstone, limestone, etc. *b*. Igneous; granite, etc.
V.	Characteristics, habits and uses of— 1. Fishes. 2. Oysters, crabs, starfishes. 3. Coral animals.	Observe characteristics— 1. Plants of the rose, pine pulse, violet, pink, mustard, composite, lily, grass and fern families.	Formation and uses— 1. Coal. 2. Mineral oils. 3. Natural gas. 4. Iron; ores.
VI.	Characteristics of Animals of the— 1. Temperate climate. 2. Tropical climate. 3. Polar climate. Uses made of them.	Pecularities, habits, uses— 1. Palm, banana, pineapple and orchid families. 2. Mosses; lichens.	1. Minerals and mines of the United States. 2. Gold and silver. 3. Copper.
VII.	Animals of the different zones of the Old World compared with those of the United States. Distribution and migration; cause; limits.	1. Zones of vegetation. 2. Limits of migration. 3. Vegetable products of commerce.	Mines and minerals of other countries.
VIII.	Relation of animal life to vegetation and civilization. Checks on animal life.	1. Culture of fruits, vegetables, fibers, grains. 2. Commercial value; benefits to man.	Minerals. 1. Constituents. 2. Commercial value and uses in the arts, etc.

TARY SCIENCE FOR THE GRADES

STRUCTURE			GRADES
GEOLOGY	PHYSICS AND CHEMISTRY	ASTRONOMY, METEROLOGY	
Rain; its effects— 1. On the surface; slopes, ponds, in valleys, streams. 2. Below the surface; springs, caverns, etc. River Basins— 1. Boundary, uses, etc. 2. Alluvial deposits.	Observe qualities; elastic, porous, etc. 1. Forms of water; their uses. 2. Atmosphere; weight, composition. 3. Magnetism; electricity. 4. Solutions. 5. Gases; hydrogen, oxygen, nitrogen, carbonic acid gas.	Observe— 1. Sun, moon, constellations. 2. Wind, clouds, rain, snow, frost, dew. 3. Their causes. 4. Effects.	I. II. III.
1. Ocean; effects of waves, tides, currents. 2. Glaciers; moraines: formation, effects. 3. Volcanoes; geysers; earthquakes. 4. Gradual elevation and depression of the earth's crust.	1. Heat; sources: sun, fuel, friction. 2. Transmission; conduction, radiation, convection. 3. Uses: warming, cooking, smelting. 4. Physical and chemical changes observed. 5. Carbon; forms; uses.	Climate; causes: 1. Winds, direction of sun's rays. 2. Surface; mountains, vegetation. 3. Bodies of water; rivers, ocean currents. Twilight; duration.	IV.
Continent building— 1. Mountains, plains, coast lines. 2. Agencies; *a*. Vegetable; peat - bogs, swamps. *b*. Animal; coral formations, shell deposits. *c*. Chemical springs, geysers, caverns, deposits in lakes and seas.	1. Light— *a*. Sources; uses. *b*. Transmission; reflection, refraction. *c*. Lenses, glasses. 2. Fermentation of fruit juices; yeast.	1. Prevailing winds. 2. U. S. weather maps. 3. Climate of the United States.	V.
1. Appalachian and Rocky mountains. 2. River basins and great lakes of the United States.	1. Magnetism; uses: compass, electro-magnets. 2. Electricity; sources and uses. 3. The levers; scales. 4. Equilibrium of bodies. 5. Chlorine.	North and South America— 1. Winds; trades, polar, variable. 2. Wind zones. 3. Weather maps.	VI.
Continent stucture— 1. South America. 2. Eurasia. 3. Australia. 4. Africa.	Pendulum; inertia, motion. Forces: gravitation, cohesion, chemical attraction. Capillary attraction; osmose pressure and flow of liquids. Testing air and water for impurities.	Trades and Monsoons. 1. Deserts; Sahara, Arabia, etc. 2. Heavy rains of India.	VII.
The earth; form, crust— 1. Rock strata; fossils. 2. Geological ages.	Sound; propagation, reflection, vibration, music. Examination of soils.	The Solar system. The moon. The sun; fixed stars. The tides; ocean currents.	VIII.

SOME GREAT MECHANICAL INVENTIONS

STEAM ENGINES

What are steam engines?

Steam engines are machines in which the elastic force of steam is used as a motive power. In the ordinary engines the alternate expansion and condensation of steam imparts to a piston an alternating rectilinear motion, which is changed into a circular motion by means of various mechanical arrangements.

The engine is unquestionably the grandest and most influential for good of all the great inventions in the realm of physics. No other contrivance of man can be compared with this gigantic, yet tractable motor, in relieving both man and beast of ceaseless toil and irksome drudgery; in preventing suffering and starvation, and promoting intercourse, progress and civilization among the nations of the earth.

Give a description of the steam engine.

Every steam engine consists essentially of two distinct parts: the apparatus in which the steam is produced, and the engine proper. We shall first describe the former.

STEAM BOILER.—The boiler is the apparatus in which steam is generated. Usually a cylindrical boiler is used for fixed engines; those of locomotives and of steam vessels are very different.

The steam is produced from water at a pressure considerably above that of the atmosphere, and is delivered to the engine with as little loss of pressure and heat as possible. The higher the pressure of the steam, the greater will be the amount of heat available, in a given weight of steam, for conversion into mechanical energy. Only a fraction of the total heat energy given to the steam in the boiler is converted into the mechanical work in the engine. By far the greater portion still remains in the steam after it has passed through the engine. The proportion of heat utilized depends on the thermal efficiency of the engine, amounting from twelve to fifteen per cent in good condensing engines; in the very best engines of large size it may be as high as twenty per cent.

The terms axis, axle, arbor, and shaft, in mechanics, are generally understood to mean the bar, or rod, which passes through the center of a wheel. A gudgeon is the pin, or support, on which a horizontal shaft turns; the pins upon which an upright shaft turns are called pivots.

The engine proper consists of a hollow *cylinder* closed at both ends; inside it is the *piston*, a sliding partition which fits the bore of the cylinder sufficiently close to prevent the steam leaking past it, but having sufficient freedom to allow it to move from end to end of the cylinder with as little friction as possible.

In modern engines the pressure of the atmosphere is not employed to drive the piston down. The steam is admitted into the cylinder above the piston at the same time that it is condensed or withdrawn from below, and thus exerts its expansive force in the returning as well as in the ascending stroke. This results in a great increase of power.

The practical construction of the piston and cylinder, and the arrangement of connecting pipes by which steam is admitted alternately above and below the piston, is fully shown in Figure A. This gives a sectional view of the cylinder, of the piston, and of the distribution of steam. The entire engine is of iron. To the piston, T, is fixed a rod, A, which slides with gentle friction in a tubulure, U, placed at the center of the plate which closes the cylinder. As it is very important that no steam shall escape between the piston-rod and this tubulure, the latter is formed of two pieces, one attached to the plate, while the other, which fits in the

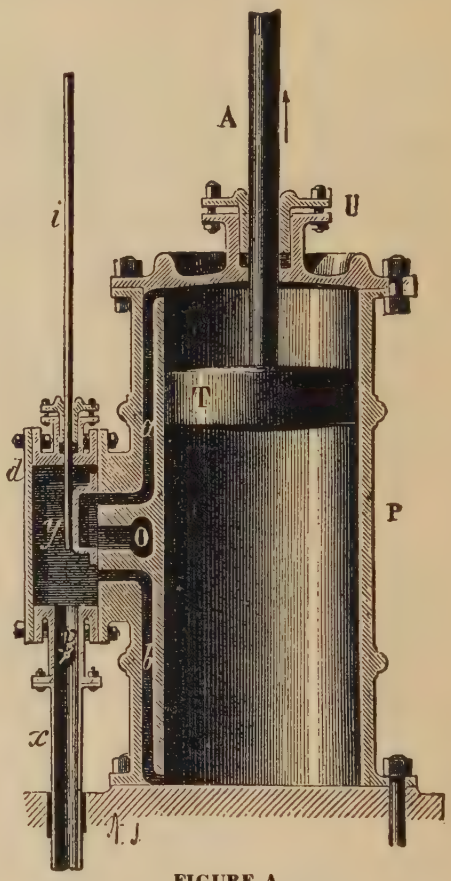


FIGURE A

first, can be pressed as tightly as is desired, so as to compress the material soaked with fat which is between the two tubulures. This arrangement is called a *stuffing-box;* it prevents the escape of steam without interfering with the motion of the piston.

VALVE-CHEST.—This is the arrangement by which steam passes alternately above and below the piston.

Figure A presents a vertical section of this valve-chest and shows its relation to the cylinder. The steam enters the valve-chest from the boiler by the brass tube *x*. From the valve-chest two conduits, *a* and *b*, are connected with the cylinder, one above and the other below. If they were both open at once, the steam, acting equally on the two faces of the piston, would keep it at rest. But one of these is always closed by a *slide-valve*, *y*, fixed to a rod, *i*. This moves alternately up and down, by means of an eccentric, *e*, placed on the horizontal shaft. The

slide-valve closes the conduit *a*, and allowing the steam to enter at *b*, below the piston, the latter rises. But when it reaches the top of the stroke the rod *i* sinks, and with it the slide-valve, which then closes the conduit *b*, and allows the steam to enter at *a*. The piston then sinks, and so forth at each displacement of the slide-valve.

It now remains to explain what happens when the steam presses below the piston. It must not remain above, otherwise the piston could not move. But while the steam enters below by the conduit *b*, the top of the cylinder, by means of the conduit *a*, is connected with a cavity, O, from which passes the tube L. Through this tube the steam which has already acted upon the piston passes into the atmosphere, or else is condensed in a vessel filled with cold water, which is called the *condenser*. If, on the other hand, the piston sinks, the vapor below the piston passes, by the conduit *b*, to the cavity O, and to the tube L.

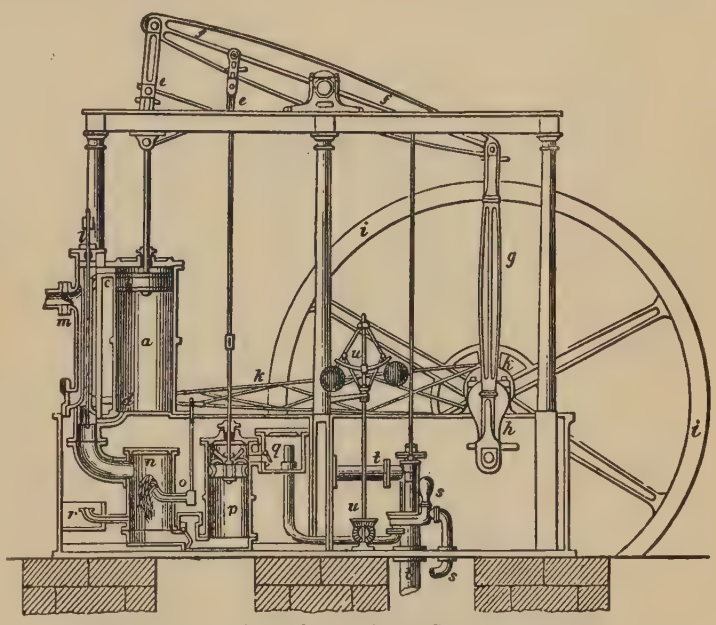


FIG. B—BEAM CONDENSING STEAM ENGINE

a, The steam-cylinder; *b*, the piston; *c*, the upper steam-port or passage; *d*, the lower steam-port; *ee*, the parallel motion; *ff*, the beam; *g*, the connecting-rod; *h*, the crank; *ii*, the fly-wheel; *kk*, the eccentric and its rod for working the steam-valve; *l*, the steam-valve and valve-casing; *m*, the throttle-valve; *n*, the condenser; *o*, the injection-cock; *p*, the air-pump; *q*, the hot-well; *r*, the shifting-valve for creating a vacuum in the condenser previous to starting the engine; *s*, the feed-pump for supplying the boilers; *t*, the cold-water pump for supplying condenser cistern; *u*, the governor.

Transmission of Motion.—The alternating rectilinear motion thus generated within the cylinder is transmitted, by means of a rod attached to the piston, to a strong beam *ff*, movable upon a central axis, a system of jointed rods *ee*, called the *parallel motion*, being interposed for the purpose of neutralizing the disturbing action which the circular path of the beam would otherwise exert upon the piston. The reciprocating motion of the beam is now, through the intervention of the connecting-rod *g* and crank *h*, converted into a circular or rotatory motion, which is rendered continuous and uniform by the fly-wheel *i*, to the axis of which the machinery to be impelled is connected.

The air-pump, *p*, for withdrawing the vapor and water from the condenser, the feed-pump, *s*, for supplying the boilers, and cold-water pump, *t*, for supplying the condenser cistern, are all worked by rods from the beam; and the governor, *u*, for maintaining uniformity of motion, is driven by a band from the crankshaft. The above description refers more immediately to that class of steam engines called *low-pressure* engines.

Types of Engines.—The various forms of the steam engine have received a varied form of classification. There are the general divisions into *condensing* and *non-condensing* engines, *compound* and *non-compound*, and *single*, *double*, or *direct acting*. Again there is the classification connected with the position of the cylinder, as in the *horizontal*, *vertical*, and *inclined* cylinder engines. Another classification divides steam engines into the uses to which they are applied, such as stationary engines, portable engines, marine, locomotive, electric generating, pumping, mill driving, winding, etc.

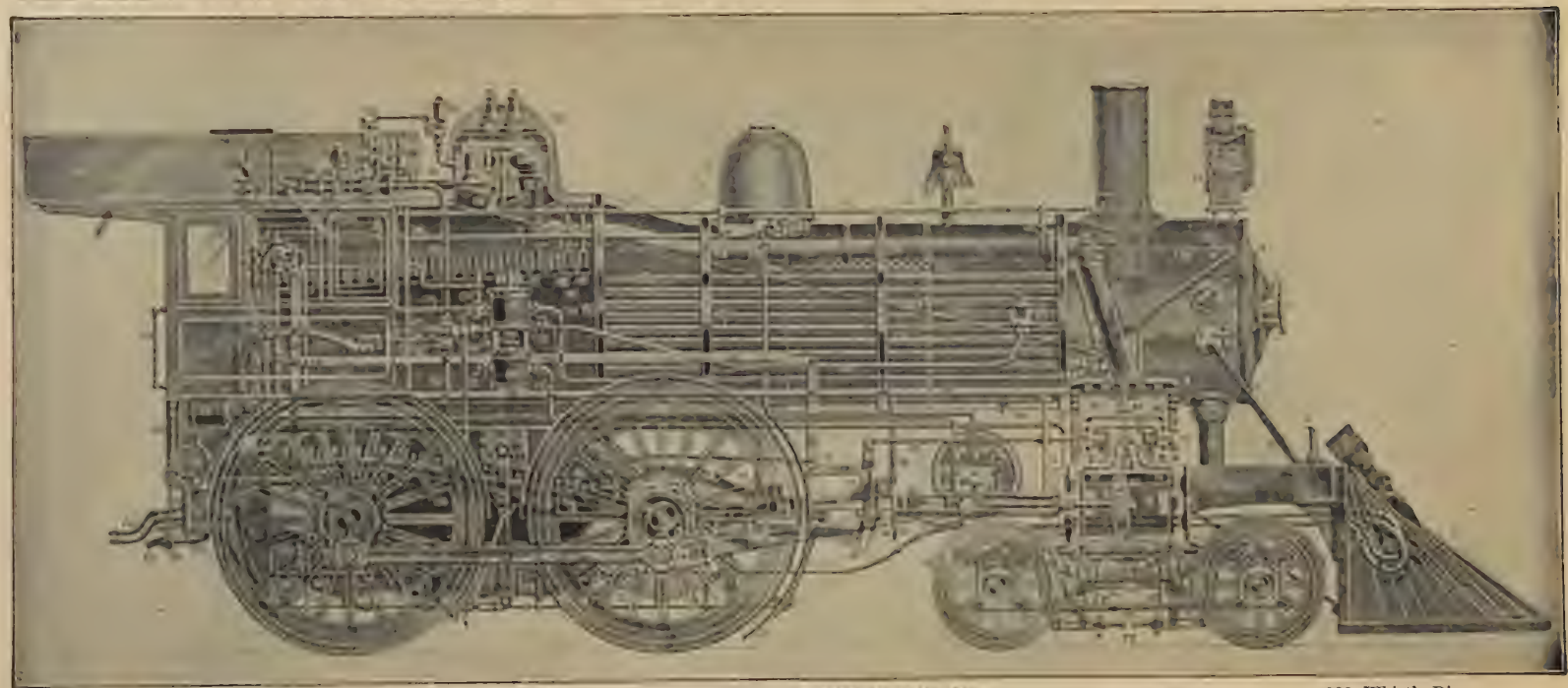
Steam Turbine.—The steam turbine, though the most modern form of the steam engine in practice, is the most ancient in actual history, the germ of the invention dating from Hero of Alexandria, in the second century B. C.

One kind of steam turbine is really worked on the same principle as a windmill, only steam is used instead of the wind. Instead, however, of the sails making one revolution in seven or eight seconds, it sometimes makes three thousand revolutions a minute, or fifty revolutions a second. In another kind the blades of the turbine are something like the pockets on a water-wheel, and the steam shoves the wheel round by its great velocity.

Turbine engines are now fitted to vessels of large dimensions, up to ocean liners and battleships, with extremely satisfactory results. Turbine engines have also been applied in various other ways, *e.g.*, to the driving of fans and blowers.

The principle of internal combustion, as used in gas and oil engines, has also been applied to the turbine with marked success, and has done much to solve the all-important problem of efficiency. It is extremely improbable that the long-range activities of the submarine would be nearly so effective were it not for the application of the same principle to their engines.

THE MARVELOUS IRON SKELETON OF THE LOCOMOTIVE AND THE NAMES OF ITS PRINCIPAL PARTS



4 Air Signal Hose
5 Air Brake Hose
11 Front Frame
12 Cinder Chute
14 Extension Front
15 Headlight Step
16 Signal Lamp
18 Smoke Arch Door
19 Smoke Arch Front
22 Headlight Case
23 Headlight Reflector
27 Deflector Plate
28 Deflector Plate Adjuster
29 Air Pump Exhaust Pipe
38 Smoke Stack
39 Arch Band Rail
44 Steam Chest
51 Steam Passages to Chest
52 Valve Seat
56 Steam Ports
57 Cylinder
58 Back Cylinder Head
59 Piston Packing
60 Piston Rod
61 Piston Head
62 Piston Packing Rings
64 Front Cylinder Head
65 Cylinder Head Casing
66 Cylinder Lagging
67 Cylinder Casing
68 Cylinder Cocks
69 Cylinder Cocks Rigging
70 Engine Truck
71 Engine Truck Wheel
73 Engine Truck Axle
75 Engine Truck Box
77 Engine Truck Frame
80 Engine Truck Equalizer
82 Engine Truck Spring
86 Truck Brake
87 Wheel Guard
88 Signal Pipe
92 Main Rod
97 Main Frame
99 Air Drum
100 Pump Connection
101 Train Pipe Connection
102 Valve Stem Rod
103 Train Pipe
104 Wash Out Plugs
108 Link Block
112 Tumbling Shaft Arm
113 Tumbling Shaft
114 Tumbling Shaft Lever
120 Check Valve Case
121 Check Valve
122 Flues
123 Oil Pipe
124 Horizontal Boiler Seam
125 Circumferential Seam
126 Boiler Lagging
127 Boiler Jacket
128 Jacket Bands
132 Bell
133 Steam Bell Ringer
134 Sand Box
135 Pneumatic Sander
136 Sand Pipe
137 Driving Wheel Tire
138 Driving Wheel Centers
140 Driver Brakes
141 Driver Springs
150 Driving Box
151 Driving Axle
152 Main Frame
158 Go Ahead Eccentric
159 Back Up Eccentric
165 Rocking Grates
168 Running Board
169 Air Cylinder Brake Pump
170 Steam Cylinder Brake Pump
173 Drip Cock
174 Pump Piston Packing
177 Governor
186 Fire Box
192 Stand Pipe
195 Throttle Valve
198 Dome
201 Safety Valves
202 Chime Whistles
203 Whistle Rig
204 Ventilator
205 Cab
207 Air Gauge
208 Steam Gauge
209 Steam Turret
213 Signal Whistle
214 Air Pump Throttle
215 Throttle Lever
216 Pneumatic Sander
216a Sand Lever
217 Reverse Lever
218 Engineer's Brake Valve
219 Gauge Cocks
222 Fire Door
229 Whistle Signal Valve
233 Signal Pipe
236 Feed Pipe

LOCOMOTIVES

Locomotive engines, or simply *locomotives*, are steam engines which, mounted on a carriage, propel themselves by transmitting their motion to wheels.

The parallel motion, the beam, and the fly wheel of the ordinary stationary engine form no part of a locomotive. The principal parts are the *framework*, the *fire box*, the *casing* of the boiler, the *smoke box*, the *steam cylinders*, with their valves, the *driving wheels*, and the *feed pump*.

The framework rests on the axles of the wheels. The illustration on another page shows clearly the arrangement and parts of a typical locomotive. It will be observed that in the lower part of the *steam dome* is the *fire box*, from whence the flame and the products of combustion pass into the smoke box, and then into the chimney after having previously traversed the numerous brass *fire tubes* which pass through the boiler. The *boiler*, which connects the fire box with the smoke box, is made of iron, and is cylindrical.

The steam passes from the boiler into two *cylinders*, placed on either side of the smoke box. There, by means of a steam chest similar to that already described, it acts alternately on the two faces of the piston, the motion of which is transmitted to the axle of the large driving wheels. After having acted on the pistons, the steam is forced through the blast pipe into the chimney, thus increasing the draft.

The motion of the pistons is transmitted to the large driving wheels by two connecting rods, which, by means of cranks, connect the piston rods with the axles of the wheels. The alternating motion of the slide valve is effected by means of eccentrics placed on the axles of the large wheels.

Wheels of the Locomotive.—The wheels range ordinarily from forty-five to eighty-five inches in diameter for drivers, thirty to forty-two inches for truck wheels. They are made of castiron or steel body and steel rim shrunk on. Spoked wheels are usual for drivers, solid wheels for trucks. The tread is four to five inches wide, the flange (one to one and one-quarter inch high) increasing this to five and one-half to seven inches. A counterbalance weight is cast between the spokes opposite the crank-pin seat. The axles, forged steel, are six to eight inches in diameter (for drivers); the wheels are forced on their ends by a powerful press. Cranked axles (for inside cylinders) are forged to shape, rarely built up.

Control.—The locomotive is controlled by the throttle-valve and the reverse lever. Both are located in the cab, which is built at the rear around the fire box, and serves also as firing platform.

Auxiliaries.—The necessary auxiliaries of the locomotive are those required for its operation as a power generator, and those necessary to its service as a railroad vehicle or as a tractor. The *tender* is the most important in the first group. It is a separate vehicle attached behind the locomotive, carrying a water tank of three to eight or nine thousand gallons capacity, and a coal bin of two to ten tons capacity. Eight-wheel (two-truck) tenders are usual. The coal space is at the front of the tender, and the water tank occupies the rear half and extends forward along the sides of the coal bin. The coal thus is reached directly from the rear of the engine cab.

Water is supplied to the engine by pipes leading from the tank to injectors on the engine. Feed pumps are rarely used for pumping the water into the boiler, injectors in duplicate being depended on. The safety valve, mounted on the top of the boiler, is of the spring poppet type. A steam whistle is placed alongside, for use as warning and train-movement signal; a bell operated from the cab by a cord is also mounted on the boiler.

The air-brake equipment of the locomotive comprises the brake mechanism for the engine itself, and an air pump with its governor, a main reservoir, and the engineer's valve, for supplying and manipulating the brakes of the entire train. The air pump is a direct-coupled compressor whose steam and air cylinders have a common piston-rod, attached in vertical position to the side of the boiler in front of the cab. The cylinder diameter is eight to ten inches. It pumps air into the main reservoir, a cylindrical tank hung under the boiler. An automatic pressure governor starts the compressor when the pressure falls and stops it when the full reservoir pressure is restored.

The locomotive brake equipment consist of brake cylinder and lever system connected to the wheel brake-shoes, but its valve control differs somewhat from that of a car, so as to permit braking the engine alone if desired. The engineer's valve is a flat-seat rotary valve with positions for supplying brakes, recharging the train-pipe, and closing all connections. A separate valve is usually supplied to operate the engine brake alone, working this as "straight-air" or non-automatic brake. Reservoir and train-pipe gauges are mounted in the engine cab near the brake handles. Steam brakes are no longer fitted on American locomotives. The driving-wheels only of the locomotive are braked, but the tender is fully braked.

The sand-box for increasing the driving-wheel friction on wet or greasy rail is commonly set on top of the boiler with discharge pipes ending in front of the drivers just above the rail. A compressed-air ejector is now often used (pneumatic sander), in which case the sand-box may be placed on the front sill or in other convenient position with equal effectiveness.

The Cab, with windows in front and sides, is built around the fire box, providing a seat on either side which commands a view ahead over the track. The reverse lever is placed on the right-hand, or engineer's side, from where also the throttle lever and brake-valve handles are reached. Injector, whistle, sander, bell, drain cocks, traction-increaser, and other appliances are controlled from here. The headlight, set on top of the boiler in front of the stack, is usually an oil lamp, with parabolic reflector. Acetylene and electric headlights are extensively used in recent years, the latter supplied by a small steam-turbine and dynamo combination.

Classes and Types of Locomotives.—The wheel-arrangement of a locomotive is, in conjunction with its total weight, the chief characteristic. Freight locomotives, running at

slow speeds, utilize a large adhesion, and therefore have a large proportion of their weight carried on drivers; they have less need for good guiding quality and steadiness at great speeds. Passenger locomotives, working at high speeds, develop a much lower tractive force, and therefore require less weight on drivers, but need leading wheels for guiding quality and steadiness.

The number and arrangement of cylinders is another characteristic of classification. Most locomotives have two cylinders, both simple. Compounds are built with two, three or four cylinders.

Recent Developments.—The chief factor in the modern modification of locomotive types and details is increase of size. The only limiting factors are boiler capacity and weight on drivers.

Economy of operation has brought compounding into much favor even for single-frame engines, and more recently has led to the wide adoption of super-heating; these improvements also allow increased power to be obtained from a boiler of given size.

Weight and Power.—Locomotives weighing seventy-five to one hundred and twenty-five tons (without tender) are common. In power, road locomotives range from three hundred to one thousand five hundred horse power and occasionally to two thousand horse power, the more modern ranging from seven hundred to one thousand five hundred. High-speed passenger locomotives are usually more powerful than heavier freights.

Boiler Performance.—The distinguishing feature of the locomotive boiler is its high evaporative capacity, and the very high rates of fuel-burning. At full power one hundred pounds coal are burned per square foot of grate surface per hour, by virtue of the strong draft produced by the exhaust-steam blast. At moderate speeds twenty-five to forty pounds are burned.

Electric Locomotives.—The operation of heavy railroad service (*i.e.* trains of freight cars and long passenger trains) by electric power requires the use of electric locomotives in place of the car-motor arrangement of street railroads. Such locomotives have been built since the middle of the nineties, and in considerable number since 1905. The earlier ones had the motors geared to the axles, or directly mounted threron, but recent constructions have the motors mounted on the frame or platform, above the wheels, so that their weight is carried by the frame springs, and the motors drive the wheels through coupling-rods either direct or by way of an intermediate jack-shaft. This form is found to give smoother running and exert less destructive effect on the track than the prior forms. In wheel arrangement these locomotives vary greatly, but recent machines exhibit combinations of coupled drivers with leading and trailing trucks not unlike the arrangement of steam locomotives. Electric locomotives of two thousand to three thousand horse power have been built, and are in regular use hauling trunk-line trains.

AËROPLANES

Flying-machines are distinguished from balloons and dirigibles in being "heavier than air," and consequently raised and supported by dynamic means alone, by the reaction of the air on surfaces driven through it.

Essentially, the aëroplane may be compared to a kite in which the pull of the string is replaced by the thrust of the propeller.

On December 17, 1903, the Brothers Wright, in America, made their first power-flight; while the very first public flight was made in France by Santos-Dumont on September 14, 1906.

Before it was possible to produce a power-driven aëroplane, experiments over a long course of years were made with aëroplanes not provided with propelling apparatus.

In its earliest form the aëroplane consisted of a flat surface moved through the air in a position slightly inclined from the horizontal; in its forward movement the plane experiences resistance from the air. As this resistance is directed partly on the under side, it will be partly converted into a lifting force. Of these two forces—head resistance or drift, and the lifting or sustaining force or lift—the first, being unproductive, must be reduced as far as possible; the second, lift, must, on the other hand, be raised to the highest possible degree.

This end is achieved by employing, instead of flat surfaces or planes, surfaces curved in the direction of flight.

The Two Types.—A *monoplane* is a machine with a single spread of surface supporting it. The best known example of a monoplane is the Bleriot. *Biplanes* have two supporting surfaces, the one above the other; the Wright and Farman machines are machines of this type. There are other machines which have been invented which have more supporting surfaces than this, the most successful of them all being the Roe triplane. But at present, at any rate, the advantage lies between the monoplane and the biplane, the other machines not yet having reached a sufficiently high standard to be able to compete with them.

The monoplane and the biplane have both their own special uses. The monoplane is obviously the lighter machine, and its head resistance is much less, hence it follows logically that its speed will be greater than that of a biplane. But the biplane is a much more stable machine than the monoplane; it will therefore probably be safer and will certainly be able to carry a greater weight.

In the making of aëroplanes wood is usually used for the framework. Specially selected wood is taken, usually from the spruce, hickory, ash, or birch, since wood combines in itself the strength and tenacity of metal without its weight. The fabric with which this frame is covered is more difficult to obtain, since it must contain in itself all the qualities of strength, lightness, smoothness, etc., without any tendencies to shrink, or rot, or burn.

The biplane carries a load of from two and one-half to three and one-half pounds per square foot of surface; the monoplane from three and one-half to six pounds per square foot. The load per horse power in each case is from thirty to forty pounds. In speed the biplane ranges from thirty-five to forty-five miles per hour, as against forty to sixty miles per hour attained by the monoplane.

Practical Uses.—From the very first days

the value of the aëroplanes, from a military point of view, has been realized, not as a weapon of offence so much as of intelligence. It would, in fact, be difficult to imagine a better means of scouting and reconnoitering than is afforded by the flying-machine. Its gradually increasing radius of action renders it available for strategical no less than for tactical reconnaissance; its easy mode of progress and absence of vibration allow the most accurate observations to be made and sketch-maps to be drawn. For dispatch-carrying over difficult country its usefulness is also considerable. Its employment for purposes of offense is much more hazardous. On the other hand, it is practically immune from artillery or rifle fire from the land, especially when flying at a fair altitude.

As a commercial vehicle, and for transport, the aëroplane, owing to its relatively low carrying power, is restricted in its usefulness. With increasing reliability, however, it may well assume a portion of the functions of the motor car.

THE MODERN AIRSHIP

The development of the balloon began in 1783, and was the work of two brothers, Joseph and Etienne Montgolfier, who were the sons of a paper manufacturer of Annonay, France.

The latest and most successful experimenter is Count Zeppelin, a German inventor, whose name has been given to the huge dirigible airships known as Zeppelins. Between these there has been a long list of inventors and experimenters who met with varying degrees of success; but the Zeppelins stand paramount.

From the year 1897 the development of the airship was the special work of the Count Zeppelin. In 1900 he made his first flight with a dirigible balloon which carried five men. It was made of aluminum, supported by gas bags and driven by two motors, each about sixteen horse power. His first experiment met with some success, but the first Zeppelin airship was succeeded by another in 1905 with greater motor power; this was wrecked and was succeeded by a third, which met with great success. This airship carried eleven passengers and attained a speed of about thirty-six miles an hour. The fourth Zeppelin airship succeeded in traveling about two hundred and fifty miles in eleven hours, but was wrecked by a storm in 1908, the wreckage catching fire and completely destroying the ship.

Zeppelin VII. had a total length of no less than four hundred and eighty-five feet, a diameter of forty-six feet, and a volume of 690,000 cubic feet. The vessel was fitted with three engines totaling some four hundred and twenty horse power and capable of driving the vessel at thirty-five miles an hour. On one occasion she carried thirty-two people and made a journey of three hundred miles in nine hours.

In the meantime many other experiments had been carried out, notably by Santos Dumont, who circled the Eiffel Tower in the face of a fresh wind.

Dirigibles are divided into three types—(*a*) *rigid*, in which there is a framework or skeleton, over which a skin is stretched and within which a number of balloons are placed; (*b*) *semi-rigid*, in which the lower part only of the balloon is distended on a flat framework; and (*c*) *non-rigid*, when a gas-bag of elongated form has a long girder suspended below it. The propellers are most usually mounted in pairs on each side of the car, but Zeppelin attached them to the balloon itself. To prevent pitching, an "empennage" of flat surfaces is usually arranged near the after-end.

Some Facts About Zeppelins.—In shape an ordinary Zeppelin airship is a long cylinder with semisphere-like ends and a keel running the whole length of the bottom thereof. In appearance from a distance the cylinder and pointed ends appear circular in shape, *i.e.* in cross-section, but in reality this is not so, both being sixteen sided. About one-third the distance from either end of the keel are small boat-like structures suspended from the hull, so close to it that at these places there is a gap in the hull to make room for them. They are rigidly connected with the metallic hull of the airship and help to support it either when the vessel rests on the ground or is towed or driven along the water.

Within these structures are the crew and engines, while above, but outward on each side of the rigid hull and connected with it by means of outriggers, are two pairs of aërial propellers. These are placed at an equal distance out on either side and in the same horizontal plane, so that their united propulsive action shall act centrally along the line of head resistance. The crew can walk through the keel (originally V-shaped) from end to end, or from one boat to the other, the passage being illuminated by means of suitable windows. An observer can also climb through the hull to take observation from the top. Telephones, electric bells, and speaking-tubes are all employed to transmit orders.

Construction of the Frame.—The frame of the rigid hull is built of sixteen longitudinals or girders of trellised or latticed metal; it runs the whole length of the airship and is riveted at regular intervals to cross-sections of latticed girders. Each of these cross-sections is in the form of a sixteen-sided figure or wheel, with latticed rims strengthened by radial rods running from a center flange or boss to the outer rims. The main hull is thus divided into a number of compartments, each separated from one another by means of these latticed radial discs or wheel-like structures and otherwise enclosed by the sixteen latticed girder longitudinals or beams. Each of these compartments contains a gas-bag or balloonette filled with hydrogen; the balloonette fairly fills the compartment, and each bag exerts its proportionate lift. A netting of ramie cords is stretched from wheel to wheel diagonally, between the beams at their inner corners, while the outward corners of the beams are joined by strong wires arranged diagonally for the purpose of imparting rigidity.

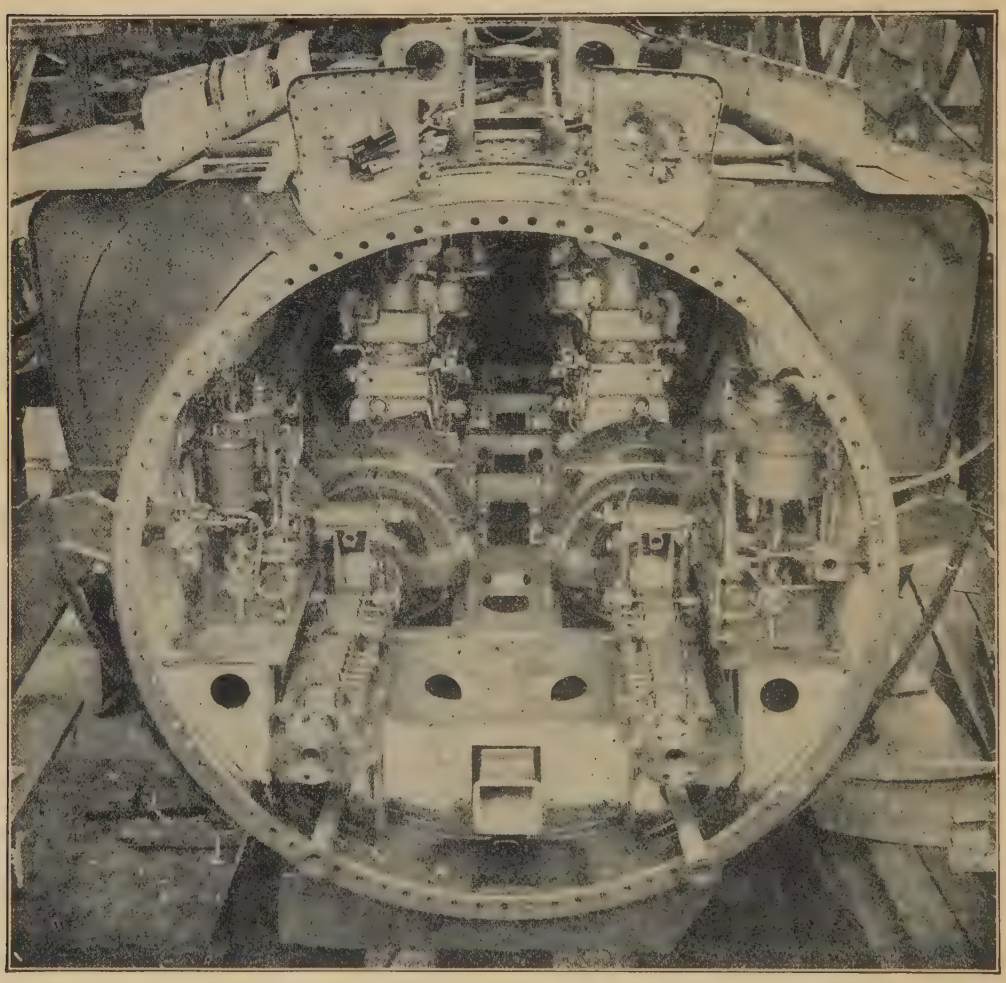
The whole frame is covered externally with a strong fabric, which forms the outer skin or wall of the hull. Air-spaces naturally exist between this covering, the inflated balloonettes, and the wheel-like divisions. The entire airship owes its buoyancy to the balloonettes filled with hydrogen, while the outer framework and covering act as a protection against the sun, foul weather, and external shocks.

War Zeppelins.—Monstrous as the above ships are, they are quite dwarfed by the recent type of military Zeppelins. The latter carry motors aggregating no less than nine hundred

horse power. The length varies from five hundred to eight hundred feet, and the diameter is proportional. The gas capacity exceeds a million cubic feet.

Aëroplane versus Airship.—On the airship's side the following strong points are claimed: (1) Greater manœuvering power than the aëroplane, more especially with respect to rapidity of ascent; (2) greater offensive power, *i.e.* ability to carry heavier guns owing to its far greater lifting capacity; (3) ability to stand still or hover in the air over one spot (for bomb-dropping), or remain stationary in the air, end on to the enemy, for the purpose of obtaining a steady gun platform; (4) greater flying durability, *i.e.* ability to remain longer in the air at a stretch; (5) ability to fly at night.

Manning the Airship.—The crew of a military airship includes the following: the pilot, the engineer, the steersman, the wireless operator, and last but by no means least the observer. The total number of the crew varies with the size of the airship, and the particular mission in view. The pilot is the captain of the airship, and is responsible for (1) the route, (2) the altitude or elevation at which the airship travels, and (3) the maintenance of the correct pressure on the envelope. The steersman maintains the course ordered him, by means of a compass or by special instructions which may be given him, and also controls the altitude or elevation as ordered. The engineer naturally looks after the engines and the mechanical part of the apparatus with which the airship is fitted.

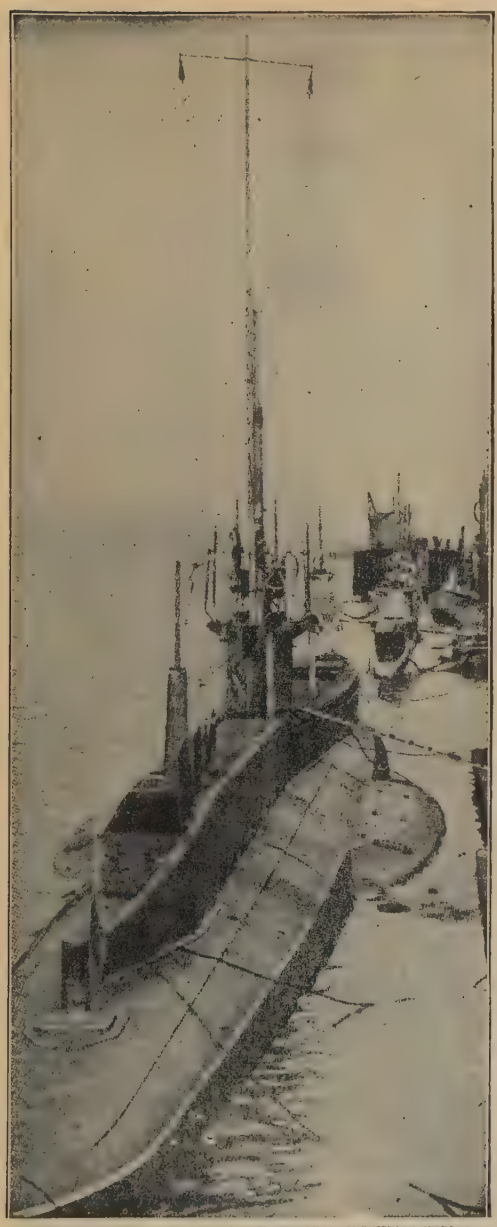


MARVELOUS MECHANISM OF THE MODERN SUBMARINE

Its interior is a steel maze of intricate machinery that fills it from end to end, and makes it easily the most remarkable of modern marine craft.

THE SUBMARINE

Though the submarine boat has only recently been brought to a high degree of practical efficiency, its history extends back to the seventeenth century, and even beyond. The modern submarine, however, whether of the American, English, or German type, has followed the model



SUBMARINE WITH WIRELESS EQUIPMENT

THE PERISCOPE OF THE SUBMARINE

is its ever watchful eye. Ordinarily the top of the periscope extends about eighteen inches above the waves. Continually revolved at a high rate of speed by an electric motor, the mirrors bring into focus the whole panorama of the upper seas so that the commander can follow in the smallest detail what is passing above him, locate vessels to be attacked, and submerge at will in the presence of danger.

of J. P. Holland, an American inventor who submitted designs to the United States government in 1895.

In 1901 the English Admiralty gave orders to the firm of Vickers, Maxim & Sons, of Barrow, to construct five of the *Holland* type and subsequently several were constructed for the United States government.

To France belongs the credit of making submarine boats a real factor in naval warfare. In 1881 M. Goubet designed a small submarine boat, and in 1885 an improved *Goubet*, which was sixteen feet five inches in length, the motive power being electricity. Successful experiments led the French Admiralty to have the *Gymnote* constructed at Toulon in 1888; she was fifty-six feet five inches long, with a displacement of thirty tons, her motive power being electricity stored in accumulators, which gave her a radius of thirty-two miles at eight knots. Her trials decided the French authorities to have more vessels built, and by 1901 there were some eleven completed.

In America, the *Hollands* have been similarly improved, but other types are also in use. The *Lake* type, named after the inventor, Simon Lake, contains an air-lock through which divers may

emerge. These vessels have been adopted by Russia.

Germany started with *Hollands*, which they have developed along their own lines. The submarine boat is found in all navies now, and has proved an enormously efficient craft; displacements of one thousand tons are not unusual and speeds as well as radius of action have shown great improvement. The Diesel engine has been largely responsible for this. In manœuvers the craft have come up to expectation competely, the experience in actual war has shown them to be among the most formidable of war craft.

There are two distinct types of submarine vessel—the submarine proper, and the submersible. The submarine sinks through the exhaustion of all its buoyancy, and she sinks at once; the submersibles are forced under.

The later, though equipped to travel on the surface of the water, are specially equipped for sinking quickly out of sight as the occasion arises. The most improved types, such as the recent German U-boats, have lofty armor plated conning towers, torpedo tubes, mounted guns, periscopes, and wireless equipments.

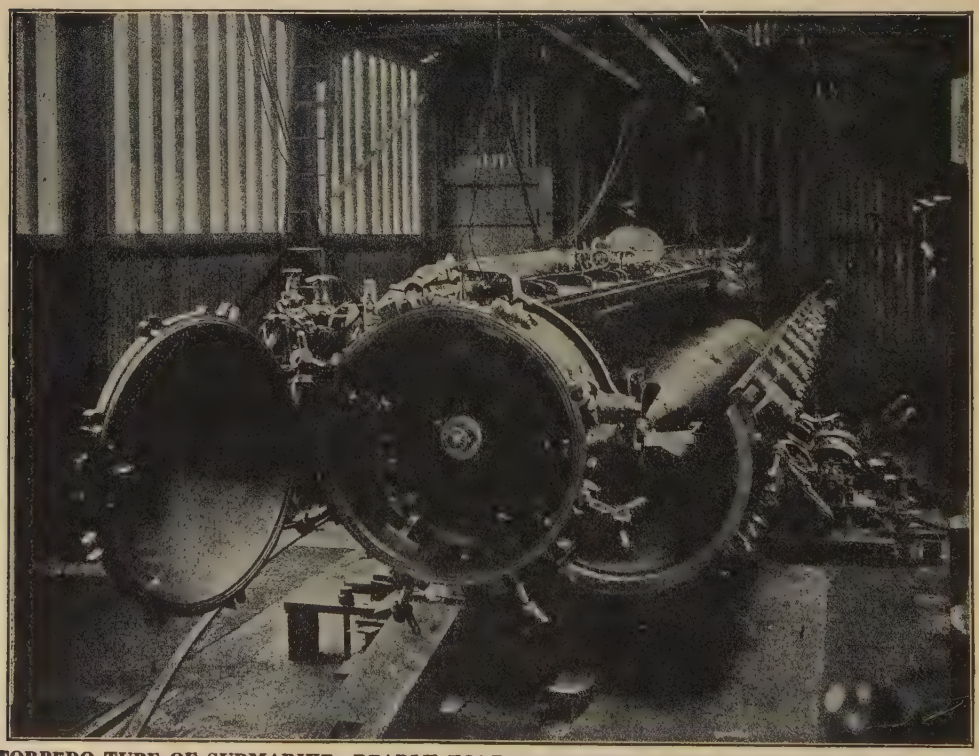
While in the present European war the submarines have shown themselves to be formidable weapons in skillful hands, they are not so formidable as to ring the death-knell of the large battleship, still less perhaps of the swift battle cruiser. Victory has usually rested with the more powerful ship and the heavier guns.

The present-day submarine suffers from two serious drawbacks: (1) inability to see under the water; (2) inefficient speed—the latter being much slower compared with the speed of fast surface boats. The chief chance of a submarine attacking an enemy with success is to come upon him unawares.

The periscopes and other optical tubes with which submarines are fitted, suffer also from many disabilities; and the fact that many collisions have occurred while using them, shows that they are not yet perfect. Obviously one showing not only what is forward of the submarine but what is on the surface of the water on every side is best. One of the drawbacks from which they suffer is the encrustation of salt on their reflecting surfaces; and small though the exposed surface of the periscope may be, there is always the chance of a vigilant enemy detecting it.

The Submarine in Peace.—It is pleasant to record that this invention, like many others of its kind, has not been devoted solely to war, but that peace also can claim its services. The recent remarkable trans-Atlantic voyages of the German submarine *Deutschland* to American ports is an illustration of their importance to commercial transportation under critical conditions. Since, too, the submarine can sink or dive down to moderate depths, it is obvious it can be used for purposes of underwater salvage, construction, and exploration.

As an aid in the construction of breakwaters, the blowing-up of submerged wrecks in comparatively speaking shallow waters, in searching for sunken treasures, and as an aid to marine explorations in suitable waters, the peace or working submarine is likely to be of untold value.



TORPEDO TUBE OF SUBMARINE—DEADLY TORPEDO SHOWN IN TUBE ON RIGHT OF PICTURE

ELECTRICITY AND MAGNETISM

What is Electricity?—Means of Exciting Electricity—Electrified and Non-Electrified Bodies—Conductors and Non-Conductors of Electricity—Electrical Machines—Positive and Negative Electricity—Velocity of Electricity—Principal Agents in Nature Exciting Electricity—Lightning—Three Forms of Lightning—Sheet and Heat Lightning—Duration of a Flash of Lightning—Places Dangerous in a Thunder Storm—How a Tree Influences Lightning—Lightning Conductors—Their Proper Principle of Construction—Franklin's Experiment with a Kite—Identity of Lightning and Electricity—Utility of Lightning-Rods—What is Thunder?—What Occasions the Rolling of Thunder?—Aurora-Borealis—Extent of the Aurora—Height of the Aurora—Appearance—Aurora-Borealis Occurs in the Day-Time—What is Galvanism?—How Galvanic Electricity Was Discovered—Construction of a Galvanic Battery—Origin of the Term "Galvanism"—Poles of a Battery—Means by Which Galvanic-Electricity in Quantity Can Be Developed—Different Forms of Galvanic Batteries—Light and Heat Produced by Galvanism—Principles and Processes of Electro-Metallurgy—Magnetism—Natural Magnets—Where Found—Bodies Capable of Being Magnetized—Induction—Magnetic Needle—The Magnetic Compass—Discovery and First Use of the Compass—Electro-Magnetism—When and How Discovered—How Iron Bars Become Magnetic—Horse-Shoe Magnets—Excitation of Magnetism—Morse's Magnetic Telegraph—Telegraph, Magnetic, Principles of—Intelligence, How Conveyed by—Electric Dynamo and Motors—Wireless Telegraphy—Wireless Telephone—X-Rays

Electricity

How may electricity be called into activity?

By *mechanical power*, by *chemical action*, by *heat*, and by *magnetic influence*.

What is the most ordinary way of exciting electricity?

By *friction*.

Do we know any reason why the means above enumerated should develop electricity from its latent condition?

We are *entirely ignorant* upon this subject.

When you rub a piece of paper with India-rubber, why does it adhere to the table?

Because the *friction* of the India-rubber against the surface of the paper develops *electricity*, to which this adhesiveness is mainly to be attributed.

Does electricity present any appearance by which it can be known?

No; electricity, like heat, is in itself *invisible*, though often accompanied by both *light* and *heat*.

When a substance, by friction or by any other means, acquires the property of attracting other bodies, in what state is it said to be?

It is said to be *electrified*, or *electrically excited;* and its motion towards other bodies, or of other bodies towards it, is ascribed to a force called electric attraction.

Does an electrified body exercise any other influence than an attractive one?

It *does;* for it will be found that light substances, after *touching* the electrified body, will *recede from it* just as actively as they approached it before contact. This is termed *electric repulsion*.

Thus, if we take a dry glass rod, rub it well with silk, and present it to a light pith ball, or feather, suspended from a support by a silk thread, the ball or feather will be attracted towards the glass. After it has adhered to it a moment, it will fly off, or be repelled. The same will happen if sealing-wax be rubbed with dry flannel, and a like experiment made; but with this remarkable difference, that when the glass repels the ball, the sealing-wax attracts it, and when the wax repels, the glass will attract. These phenomena are examples of *electrical attraction* and *repulsion*.

What is a non-electrified body?

One that holds its own natural quantity of electricity *undisturbed*.

What happens when an electrified body touches one that is non-electrified?

The electricity contained in the former is *transferred* in part to the latter.

Thus, on touching the end of a suspended silk-thread with a piece of excited wax, the silk will be excited, as will be shown by its moving towards a book, piece of metal, or any other object placed near it.

Do all bodies conduct or allow electricity to pass through them equally well?

Although there is no substance that can *entirely prevent* the passage of electricity, nor any that does not oppose *some resistance* to its passage, yet it moves with a much greater facility through a certain class of substances than through others. Those substances which facilitate its passage are called conductors; those that retard or almost prevent it, are called non-conductors.

What substances are good conductors of electricity?

The *metals*, *charcoal*, the *earth*, *water*, and *most fluids*, except oils, the *human body*, etc., are good conductors.

What substances obstruct the passage of electricity, or are "non-conductors"?

Glass, *resin*, *oil*, *silk*, *sulphur*, *dry air*, etc., etc., are non-conductors.

What is an electrical machine?

An electrical machine is an arrangement by which quantities of electricity can be collected and discharged.

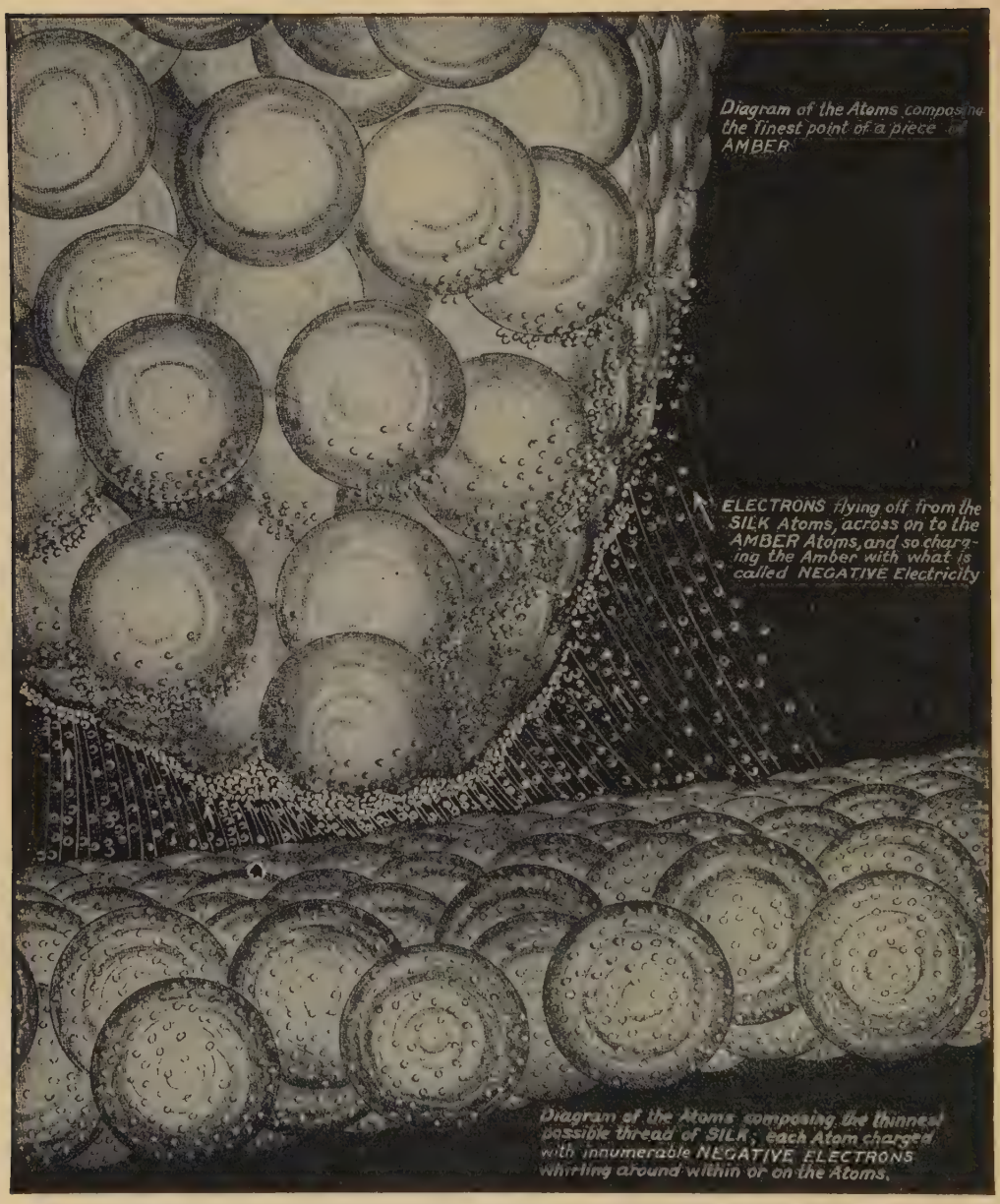
One type of the electrical machine most usually employed consists of a large circular plate of glass, mounted upon a metallic axis, and supported upon pillars fixed to a secure base, so that the plate can, by means of a handle, be turned with ease. Upon the supports of the glass, and fixed so as to press easily but uniformly on the plate, are four rubbers; and flaps of silk, oiled on one side, are attached to these, and secured to fixed supports by several silk cords. When the machine is put in motion, these flaps of silk are drawn tightly against the glass, and thus the friction is increased, and electricity excited.

Do we know what electricity is?

No; a complete and final answer to this question is no more possible than the answer to the question—what is *life?* The *theory* of electricity, however, opens up possibilities of the most fascinating nature; it gives us a wonderfully clear conception of which might be called the inner mechanism of electricity; and it even introduces us to the very atoms of electricity.

Give a short outline of the theory of electricity.

Early Theories.—Early writers on the nature of electricity supposed it to be either a fluid of peculiar properties or else two fluids whose properties were complementary to each other or of opposite kinds; Franklin held the *one fluid* theory. Later physicists arrived at the conclusion that whatever electricity might be, it was not a material substance. As an



HOW ELECTRICITY IS PRODUCED BY THE ACTIVITY OF ELECTRONS

alternative it was suggested that electricity was a form of energy, but this proved untenable.

Electron Theory.—This, with certain reservations, is held by the scientific world of today. All matter is believed to be constituted of minute particles called "atoms," whose diameter has been estimated at about one millionth of a millimeter. Up to a few years ago the atom was believed to be quite indivisible, but it has been proved beyond doubt that this is not the case. An atom may be said to consist of two parts, one much larger than the other. The smaller part is negatively electrified, and is the same in all atoms; while the larger part is positively electrified, and varies according to the nature of the atom. The small negatively electrified portion of the atom consists of particles called "electrons," and these electrons are believed to be indivisible units or atoms of negative electricity.

The electrons in an atom are not fixed, but move with great velocity, in definite orbits. They repel one another, and are constantly endeavoring to fly away from the atom, but

they are held in by the attraction of the positive core. So long as nothing occurs to upset the constitution of the atom, a state of equilibrium is maintained and the atom is electrically neutral; but immediately the atom is broken up by the action of an external force of some kind, one or more electrons break their bonds and fly away to join some other atom. An atom which has lost some of its electrons is no longer neutral, but is electro-positive; and similarly, an atom which has gained additional electrons is electro-negative.

THE ELECTRIC CURRENT.—A current of electricity is believed to be nothing more or less than a stream of electrons, set in motion by the application of an electro-motive force. Some substances are good conductors of electricity, while others are bad conductors or non-conductors. In order to produce an electric current, that is a current of electrons, it is evidently necessary that the electrons should be free to move. In good conductors, which are mostly metals, it is believed that the electrons are able to move from atom to atom without much hindrance, while in a non-conductor their movements are hampered to such an extent that interatomic exchange of electrons is almost impossible.

Does electricity seem to exist in two different states or conditions?

It does; and to designate these two conditions, the terms positive and negative have been employed. Thus a body which has an overplus of electricity is called positive, and one that has less than its natural quantity is called negative.

Do light, heat, and electricity appear to have some properties in common?

They *do;* each may be made, under certain circumstances, to *produce* or *excite* the other. All are so light, subtle, and diffusive, that it has been found impossible to recognize in them the ordinary characteristics of matter. Some suppose that light, heat, and electricity are all *modifications* of some common principle.

Why does the fur of a cat sparkle and crackle when rubbed with the hand in cold weather?

Because the friction between the hand and fur produces an excitation of *positive electricity* in the *hand* and *negative* in the *fur*, and an interchange of the two causes a spark, with a slight noise.

Why does this experiment work best in very cold weather?

Because the air is then *very dry*, and does not *convey away* the electricity as fast as it is excited; if the air, on the contrary, were *moist*, the electricity would be *conducted off* nearly as fast as it was excited by friction, and its effects would not therefore be so manifest.

With what velocity is electricity transmitted through good conductors?

With a velocity so great that the most rapid motion produced by art appears to be actual rest when compared to it. Some authorities have estimated that electricity will pass through copper wire at the rate of *two hundred and eighty-eight thousand miles in a second* of time—a velocity greater than that of light.

What agents are undoubtedly the most active in producing and exciting electricity in the operations of nature?

The *light* and the *sun's rays.*

Do some animals have the power of exciting electricity within themselves?

There *are* certain animals which are *gifted* with the extraordinary power of *producing electrical phenomena* by an effort of muscular or nervous energy. Among these the electrical eel and the torpedo are most remarkable.

How powerful a charge of electricity can the electrical eel send forth when in full vigor?

Sufficient to *knock down a man or stun a horse.*

Is the electricity generated by these animals the same as that occasioned by the ordinary electrical machine?

It *is the same*, and produces the *same effects.*

Do vital action and muscular movements in man and animals give rise to electricity?

They *do;* and it can be shown by direct experiment that a person cannot even *contract the muscles of the arm* without exciting an electrical action.

Does change of form or state in bodies generally produce electrical excitation?

Change of form or state is one of the *most powerful methods* of exciting electricity.

Water, in passing into steam by artificial heat, or in evaporating by the action of the sun or wind, generates large quantities of electricity. The crystallization of solids from liquids, all changes of temperature, the growth and decay of vegetables, are also instrumental in producing electrical phenomena.

What is lightning?

Lightning is *accumulated electricity*, generally discharged *from the clouds* to the earth, but sometimes from the earth to the clouds.

What causes the discharge of an electric cloud?

When a cloud *overcharged* with electric fluid approaches another which is *undercharged*, the fluid rushes from the former *into the latter*, till both contain the *same quantity.*

Is there any other cause of lightning besides the one just mentioned?

Yes; sometimes mountains, trees, and steeples will discharge the lightning from a cloud floating near, and sometimes the electricity passes from the earth into the clouds.

How high are the lightning clouds from the earth?

Sometimes they are elevated *four or five miles high*, and sometimes actually touch the earth with one of their edges; but they are rarely discharged in a thunder storm when they are more than seven hundred yards above the surface of the earth.

What is a thunder storm?

The *disturbance* caused in the *air* when successive discharges of accumulated electricity take place.

Into how many kinds has lightning been divided?

Three.

What are they?

The *zig-zag lightning*, *sheet lightning*, and *ball lightning.*

Why is lightning sometimes forked?

Because the lightning cloud is at a *great distance;* and the *resistance of the air* is so great that the electrical current is diverted into a zig-zag course.

How does the resistance of the air make the lightning zig-zag?

As the lightning condenses the air in the immediate advance of its path, it flies from side to side, in order to pass where there is the *least resistance.*

Why is the flash sometimes quite straight?

Because the lightning cloud is near the earth, and as the flash meets with very little resistance, it is not diverted; in other words, the flash is straight.

What is sheet lightning?

Either the reflection of distant flashes not distinctly visible or beneath the horizon, or else *several flashes intermingled.*

FRANKLIN AND HIS KITE

What other form does lightning occasionally assume?

Sometimes the flash is *globular*, which is the most dangerous form of lightning.

Does a discharge produce a flash when it passes through good conductors?

It *does not*, but passes quietly and invisibly.

What is heat lightning?

Sometimes it is the *reflection* in the atmosphere of the lightnings of storms *very remote*, the storms themselves being so far distant that their thunders cannot be heard. This phenomenon is also occasioned by the play of silent flashes of electricity between the earth and the clouds, the amount of electricity developed not being sufficient to produce any other effects than the mere flash of light.

Why is lightning more common in summer and in autumn than in spring and winter?

Because the heat of summer and autumn produces *great evaporation*, and the conversion of *water into vapor* always develops *electricity.*

How long is the duration of a flash of lightning?

Arago has demonstrated that it does not exceed the *millionth part of a second.*

With what velocity is lightning, or the electric fluid which gives rise to its appearance, supposed to move?

Not less than *two hundred and fifty thousand miles per second.*

By whom was the identity of lightning and electricity first established?

By *Dr. Franklin*, at Philadelphia, in 1752.

The manner in which this fact was demonstrated, was as follows:

Having made a kite of a large silk handkerchief stretched upon a frame, and placed upon it a pointed iron wire connected with the string, he raised it upon the approach of a thunder storm. A key was attached to the lower end of the hempen string holding the kite, and to this one end of a silk ribbon was tied, the other end being fastened to a post. The kite was now insulated, and the experimenter for a considerable time awaited the result with great solicitude. Finally, indications of electricity began to appear on the string; and on Franklin presenting his knuckles to the key, he raised an electric spark. The rain beginning to descend, wet the string, increased its conducting power, and vivid sparks in great abundance flashed from the key.

Why was the kite insulated when Franklin fastened the key to the post with a silk ribbon?

Because the silk was a *non-conductor*, and would not allow the electricity received upon the kite to pass off by means of the string to the ground.

Was this experiment one of great danger and risk?

It was; because the whole amount of electricity contained in the thunder cloud was *liable to pass from* it, by means of the string, to the earth, notwithstanding the use of the silk insulator.

Have we any proof of the utility of lightning rods?

The experience of a hundred years has shown that when all the *necessary rules* have been *observed*, the protection is perfect, as far as human effort can avail.

Is a building more or less liable to be struck when furnished with a good lightning conductor?

Lightning conductors do *not*, as many suppose, *attract the lightning toward the building* on which they are situated; they simply *direct its course*, and *facilitate* the *passage* of the *fluid* in the most direct way to the earth, only when a discharge must inevitably occur. There is no attraction, but the lightning takes the road which offers the least resistance.

What is thunder?

It is a certain *noise* proceeding apparently from the clouds, which usually follows, after a greater or less interval, the appearance of a flash of lightning.

How is it supposed to be occasioned?

The usual explanation offered is a *sudden displacement of the air* produced by the electrical discharges in which the lightning is evolved.

Others have supposed that the passage of the electric current creates a vacuum, and that the air rushing in to fill it produces the sound. Any explanation that has yet been offered is not altogether satisfactory.

What occasions the rolling of the thunder?

It has been ascribed to the *effect of echo;* but the true cause probably is, that the sound is developed by the lightning in passing through the air, and consequently separate sounds are produced at every point through which the lightning passes.

Why is thunder sometimes one vast crash?

Because the lightning cloud is *near the earth;* and as all the vibrations of the air (on which sound depends) reach the ear at *the same moment,* they seem like one vast sound.

Why is the thunder generally heard several moments after the flash?

Because it has a *long distance* to travel. Lightning travels nearly *a million* times faster than thunder; if, therefore, the thunder has *a great distance to come,* it will not reach the earth till a considerable time *after the flash.*

Can we not tell the distance of a thunder cloud by observing the interval which elapses between the flash and the peal?

Yes; the flash is instantaneous, but the thunder will take a whole *second of time* to travel three hundred and eighty yards; hence, if the flash be five seconds before thunder, the cloud is nineteen hundred yards off.

i. e. $380 \times 5 = 1900$ yards.

What is the aurora borealis or northern lights?

Luminous appearances seen in the *sky* at night-time. Sometimes streaks of blue, purple, green, red, etc., and sometimes flashes of light, are seen.

What is the cause of the aurora borealis or northern lights?

Electricity in the higher regions of the atmosphere is undoubtedly an active agent in producing this phenomenon.

Is the aurora ever seen in other parts of the heavens than towards the north?

In the northern hemisphere it always appears in the *north,* but in the southern hemisphere it appears in the *south:* it seems to originate at or near the *poles of the earth,* and is consequently seen in its greatest perfection within the arctic and antarctic circles.

What is known concerning the extent of the aurora?

It is not *local,* but it is seen simultaneously at places widely remote from each other, as in Europe and America.

What calculations have been made respecting the height of the aurora?

The height of the appearances varies from *one to two hundred miles;* they sometimes appear within the region of the clouds, and very near to the earth.

Do the auroras appear at any particular seasons and times?

They appear more frequently in the *winter* than in the summer, and are only seen at *night.*

Do they also occur in the day-time?

The aurora is known to *affect the magnetic needle* and the telegraph; and as the effects upon these instruments are noticed by day as well as by night, there can be no doubt of the occurrence of the aurora at all hours. The intense light of the sun renders the auroral light invisible during the day.

Of what utility are the auroral appearances in the polar regions?

During the long polar night, when the sun is absent, the aurora appears with a magnificence unknown in other regions, and affords *light sufficient* for many of the *ordinary outdoor employments.*

Magnetism

Is there any connection between magnetism and electricity?

There is every reason to believe that magnetism and electricity are but *modifications of one force.*

What is a loadstone or a natural magnet?

It is an *ore of iron,* known as the "*protoxide of iron,*" or "*magnetic oxide of iron,*" which is capable of attracting other pieces of iron to itself; and if suspended freely by a thread, and left to take its own position, it will arrange itself so that its extremities will point towards the north and south poles of the earth.

Are natural magnets rare?

They are *not;* they are found in many places in the *United States.* In *Arkansas,* especially, an ore of iron possessing remarkably strong attractive powers is very abundant.

The magnetic ore is usually of a dark gray hue, and possesses but little metallic luster. If a piece of this ore be dipped in iron filings, or a number of small needles, they will generally be found collected and clinging together in great quantities at two opposite extremities, whilst the middle portion is nearly destitute. The magnetic property, whatever it may be, seems therefore to be collected and act with the greatest energy at two opposite extremes; these have been termed *poles.*

What is the origin of the terms "magnet" and "magnetism"?

The loadstone or natural magnet was first found at *Magnesia,* in Lydia, Asia, whence were derived the names.

Can a natural magnet communicate its attractive properties to other bodies by contact?

It *can,* and that too without any *apparent loss* of attractive strength.

What bodies are capable of being magnetized by contact with natural magnets?

Iron and *steel* are the substances most susceptible of this influence, but brass, nickel, and cobalt can also become magnets.

Does the magnetism imparted to a piece of soft iron, or steel, by contact with a natural magnet, remain permanent in their substances?

In the *steel* it *does,* but the soft iron *loses its power* as soon as it is removed from the magnet.

Is it necessary that absolute contact should take place between a magnet and a piece of soft iron to render the latter a magnet?

No, every piece of soft iron brought *near* a magnet becomes by induction itself a magnet.

What do you mean by induction?

It is the production of *like effects* in *contiguous bodies.* In electricity or magnetism, it is the influence exerted by an electrified or magnetized body through a non-conducting medium without any apparent communication of a current.

What is meant by the directive power of the magnet?

It is that power which will cause a magnet, when suspended freely, to constantly *turn the same part* towards the north pole and the opposite part towards the south pole of the earth.

What are the poles of a magnet?

They are the *ends* of the magnet, and are denominated north and south, according as they point to the north or south poles of the earth.

What are the poles of the earth?

The *extremities of the earth's axis,* or the points on the surface of the globe through which the axis passes.

What is a magnetic needle?

Simply a *bar of steel* which is a *magnet,* suspended in such a way that it can *freely turn* to the north or south.

DIAGRAM SHOWING THE VARIATION OF THE MAGNETIC AND GEOGRAPHICAL POLES

What is a mariner's compass?

It is a *delicate steel bar or needle* balanced upon a *pivot* placed beneath its center of gravity in such a way that it can turn horizontally without obstruction. This needle is usually inclosed in a box, upon the bottom of which is a card, with the various points—north, south, east, west, etc., etc., marked upon it.

Such a needle, if the box containing it be placed on a level surface, will generally be observed to vibrate more or less, till it settles in such a direction that one of its extremities or poles will point towards the north, and the other consequently towards the south. If the position of the box be altered or reversed, the needle will always turn and vibrate again, till its poles have attained the same direction as before.

Does the compass needle always point exactly north and south?

It does *not;* its natural direction is towards the north and south poles, but it seldom points due north or south.

Who first discovered the fact that a magnet would invariably point to the north and the south, and made use of this knowledge in constructing a compass?

It is claimed to have been discovered by the *Chinese:* it was known in Europe, and used in the Mediterranean, in the thirteenth century.

How were the compasses of that time constructed?

They were merely *pieces of loadstone* fixed to a *cork*, which floated on the surface of water.

Is the earth itself supposed to be a magnet?

It is undoubtedly a *great magnet.*

Is iron under certain circumstances rendered magnetic by the inductive action of the earth's magnetism?

Most *iron bars* and *rails*, as the vertical bars of windows, that have stood for a considerable time in a perpendicular position, will be found to be *magnetic.*

If we suspend a bar of soft iron sufficiently long in the air, will it assume magnetic properties?

It *will* gradually *become magnetic;* and although when it is first suspended it points indifferently in any direction, it will at last point *north and south.*

How may a bar of iron, such as a kitchen poker, be made immediately magnetic, without resorting to the use of other magnets?

If the bar devoid of magnetism is placed with *one end on the ground*, slightly inclined towards the north, and then struck one *smart blow* with a *hammer* upon the upper end, it will immediately acquire *polarity*, and exhibit the attractive and repellant properties of a magnet.

What is a horseshoe magnet?

It is a *magnetic bar* bent into the *form of a horseshoe.*

When a piece of iron not magnetic is brought in contact with a common magnet, it will be attracted by either pole; but the most powerful attraction takes place when both poles can be applied to the surface of the piece of iron at once. The magnetic bars are for this purpose bent into the shape of the letter U, and are termed *horseshoe magnets.* Several of these are frequently joined together with their similar poles in contact; they then constitute a *magnetic battery*, and are very powerful, either for lifting weights, or charging other magnets.

If we break a magnet across the middle, what happens?

Each fragment becomes converted into a *perfect magnet;* the part which originally had a north pole acquires a south pole at the fractured end, and the part which originally had a south pole, gets a north pole.

If we divide a magnet to the extreme degree of mechanical fineness possible, will the pieces possess magnetic powers?

Each fragment, however small, will be a *perfect magnet.*

Galvanism

What is galvanism?

It is the production of *electrical disturbance by chemical action.*

What is the most simple manner of illustrating the production of this electricity?

If we place a piece of silver on the tongue, and a piece of zinc underneath it, no effect will be produced as long as the two metals are kept asunder; but when their ends are brought together, a *distinct thrill* will pass through the tongue, a metallic taste will diffuse itself, and, if the eyes are closed, a sensation of *light* will be evident at the same moment.

To what is this result owing?

To a *chemical action* developed the moment the two metals touched each other.

The *saliva* of the tongue *oxidizes* a portion of the *zinc*, which excites *electricity*, for no chemical action ever takes place without producing electricity. Upon bringing the ends of the two metals together, a slight current passes from one to the other.

By whom was the production of galvanic electricity first noticed?

By *Galvani*, professor of anatomy at Bologna, Italy, in 1790.

Having occasion to dissect several frogs, he hung up their hind legs on some *copper hooks*, until he might find it necessary to use them for illustration. In this manner he happened to suspend a number of the copper hooks on an iron balcony, when, to his great astonishment, the limbs were thrown into violent convulsions.

On investigating the phenomena what did Galvani discover?

He found that whenever the nerves of a frog's leg were touched by one metal and the muscles by another, convulsions took place on bringing the two different metals in contact.

What is the simplest way of exciting a current of galvanic electricity?

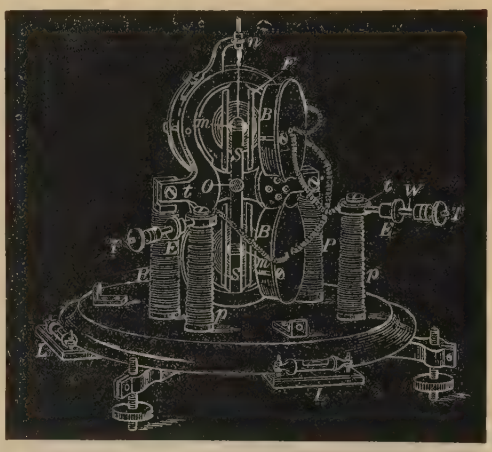
By arranging a *series of metal plates in a pile*, placing them in pairs, with a wet cloth between them, it being necessary that one of each pair should be more easily oxidized than the other. The simple contact of these plates will produce a feeble and continued galvanic current.

What is such an arrangement of plates for producing electrical currents called?

A *galvanic* or *voltaic battery.*

Why are the terms "galvanic" and "voltaic" applied?

They originated in honor of *Galvani* and *Volta*, the Italian philosophers who first developed these phenomena of chemical electricity, and the means of producing them.



HIGH-RESISTANCE GALVANOMETER FOR VERY SMALL CURRENTS

Are there many metals or other substances which, when brought together, are capable of producing galvanic action?

The number is *quite large;* among them we may enumerate the following: *zinc, lead, tin, antimony, iron, brass, copper, silver, gold, platinum, black lead* or *graphite*, and *charcoal.*

Will any two of these brought together produce a galvanic current?

They *will;* but they possess the power in *different degrees;* and the more remote they stand from each other in the order above given, the more decidedly will the chemical electricity be developed.

Thus zinc and lead will produce a voltaic battery, but it will be much less active than zinc and iron, or the same metal and copper, and this last less active than zinc and platinum, or zinc and charcoal.

Does galvanic or voltaic electricity appear to consist of two kinds, positive and negative, as in ordinary electricity?

It does; positive electricity always flows *from the metal which is acted upon* most powerfully, and negative electricity *from the other.*

What do we mean when we speak of a galvanic circuit?

The connection of the two metals in the battery, so that the positive and negative electricities can *meet, and flow in opposite directions.*

At what point in the circuit will the manifestations of electricity be most apparent?

At the point where the *two currents meet.*

What is meant by the poles of the battery?

The two metals forming the elements of the battery are generally connected by copper wires; the *ends* of these wires, or the *terminal points* of any other connecting medium used, are called the poles of the battery.

Thus, when zinc and copper poles are used, the end of the wire conveying positive electricity from the zinc would be the positive pole, and the end of the wire conveying negative electricity from the copper plate would be the negative pole. Faraday describes the poles of

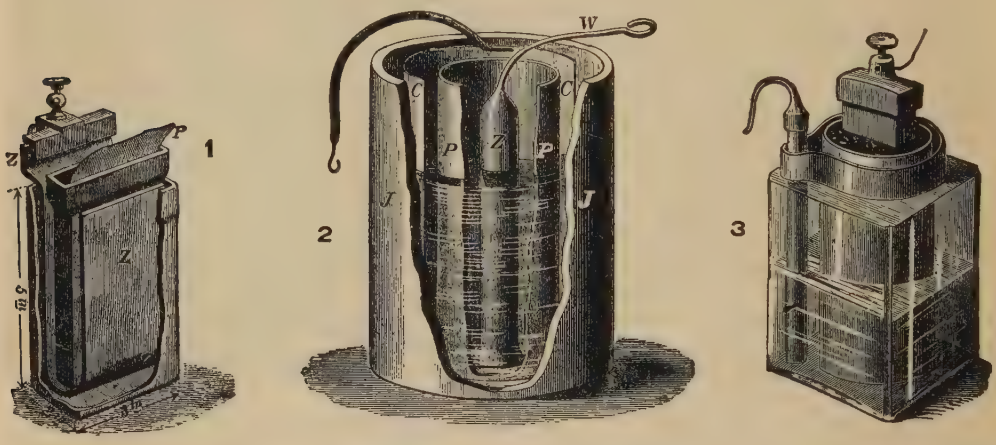
the battery as the doors by which electricity enters into or passes out of the substance suffering decomposition.

A very simple, and at the same time an active, galvanic circuit may be formed by an arrangement as represented in the accompanying illustration. The current of positive electricity, when the circuit is closed, passes from the zinc, through the liquid, to the copper, and from the copper, along the conductors to the zinc. A current of negative electricity traverses the circuit also, from the copper to the zinc, in a direction precisely reversed.

By what chemical action can the greatest abundance of galvanic electricity be developed?

By the *oxidation of metallic zinc* by weak sulphuric acid.

Returning to the voltaic cell, we may imagine that the atoms of the zinc which are immersed in the acid are trying to turn themselves into ions, so that they can travel through the solution. In order to do this each atom parts with two electrons, and these electrons try to attach themselves to the next atom. This atom, however, already has two electrons, and so in order to accept the newcomers it must pass on its own two. In this way electrons are passed on from atom to atom of the zinc, then along the connecting wire, and so to the copper plate.



TYPES OF ELECTRIC CELLS OR "BATTERIES"

(1) *Grove's Cell.*—Z, Zinc plate in dilute sulphuric acid; P, platinum plate in strong nitric acid. (2) *Daniell's Cell.*—Z, Zinc rod in porous pot P containing dilute sulphuric acid; C, copper plate in outer vessel containing copper sulphate solution. (3) *Leclanche Cell.*—Zinc in sal-ammoniac solution; carbon slab in charcoal and manganese dioxide.

The electricity developed by the action of a single pair of plates immersed in acid water is very feeble: how can it be increased?

By increasing the *number of the plates* and the quantity of the liquid, we increase the intensity of the electricity developed.

Action Within a Voltaic Cell.—Let us try to see now how an electric current is set up in a simple voltaic cell, consisting of a zinc plate and a copper plate immersed in dilute acid. First we must understand the meaning of the word *ion.*

If we place a small quantity of salt in a vessel containing water, the salt dissolves, and the water becomes salt, not only at the bottom where the salt was placed, but throughout the whole vessel. This means that the particles of salt must be able to move through the water. Salt is a chemical compound of sodium and chlorine, and its molecules consist of atoms of both these substances. It is supposed that each salt molecule breaks up into two parts, one part being a sodium atom, and the other a chlorine atom, and further, that the sodium atom loses an electron, while the chlorine atom gains one. These atoms have the power of traveling about through the solution, and they are called *ions,* which means "wanderers."

An ordinary atom is unable to wander about in this way, but it gains traveling power as soon as it is converted into an ion, by losing electrons if it be an atom of a metal, and by gaining electrons if it be an atom of a non-metal.

The atoms of zinc which have lost their electrons thus become ions, with power of movement. They leave the zinc plate immediately, and so the plate wastes away or dissolves. So we get a constant stream of electrons traveling along the wire connecting the two plates, and this constitutes an electric current.

What are the most ordinary effects produced by the developed electricity of a large galvanic battery?

The *production of sparks* and *brilliant flashes of light,* the heating and fusing of metals, the deflagration of gunpowder and other inflammable substances, and the decomposition of water, saline compounds, and metallic oxides.

How may the most splendid artificial light known be produced?

By fixing pieces of *pointed charcoal* or *carbon* to the wires connected with opposite poles of a powerful galvanic battery, and bringing them into *contact.*

What does this produce?

Electric light.

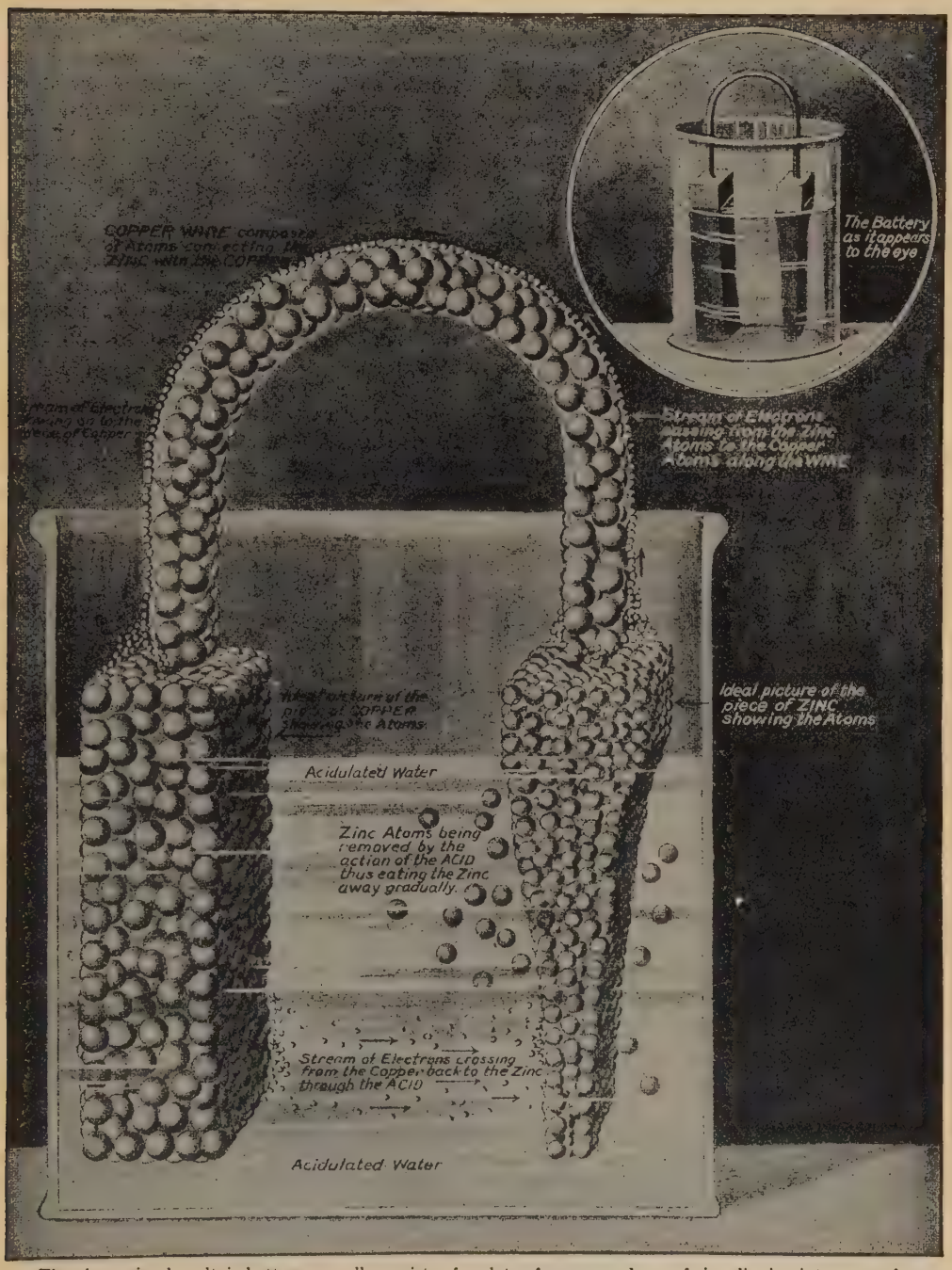
Can intense heat be developed by the action of the galvanic battery as well as intense light?

The *greatest artificial heat* man has yet succeeded in producing has been through the agency of the *galvanic battery.*

What refractory substances can be fused by the aid of the galvanic battery?

All the metals, including platinum, can be *readily melted;* quartz, sulphur, magnesia, slate and lime are liquefied; and the diamond fuses, boils, and becomes converted into coal.

HOW AN ELECTRIC BATTERY GENERATES ELECTRICITY



The above simple voltaic battery, or cell, consists of a plate of copper and one of zinc dipping into a vessel containing dilute sulphuric acid to twenty of water by volume. When these plates are joined externally by a wire or other conductor a current flows from the copper plates, called the positive pole of the battery, to the zinc plate, called the negative pole of the battery. This is due to the fact that a difference of *potential* is set up between the plates on immersion in the acid, in consequence of which an electro-motive force is generated that drives the current round the circuit. The potential between the plates is maintained by the chemical action now going on in the cell. This action results in the gradual consumption of the zinc plate with formation of zinc sulphate and evolution of hydrogen at the copper plate. In a short time the current in the circuit falls off in consequence of *local action* and *polarization*.

What is electrotyping, or electro-metallurgy?

It is the art or process of *depositing*, from a *metallic solution*, through the agency of galvanic electricity, a *coating* or *film* of metal upon some other substance.

Upon what principles is it accomplished?

The process is based on the fact, that when a galvanic current is passed through a solution of some metal, as a solution of sulphate of copper (sulphuric acid and copper), *decomposition takes place;* the metal is separated in a metallic state, and attaches itself to the negative pole, or to any substance that may be attached to the negative pole; while the acid or other substance before in combination with the metal, goes to, and is deposited on the positive pole.

In this way a medal, a wood-engraving, or a plaster cast, if attached to the negative pole, may be covered with a coating of copper; if the solution had been one containing silver or gold, the substance would have been covered with a coating of silver or gold instead of copper.

How can the thickness of the deposits be regulated?

The thickness of the deposit, providing the supply of the metallic solution be kept constant, will depend on the *length of time the object is exposed to the influence of the battery.*

Electro-Magnetism

What is electro-magnetism?

It is the magnetism developed through the agency of *electrical* or *galvanic action.*

What were the earliest phenomena observed which indicated a relation between magnetism and electricity?

It was noticed that *ships' compasses* have their directive power impaired by lightning, and that sewing needles could be rendered magnetic by electric discharges passed through them.

What discovery, made by Prof. Oersted of Copenhagen, established beyond a doubt the connection of electricity and magnetism?

He ascertained that a magnetic needle placed near a metallic wire connecting the poles of a galvanic battery was compelled to change its direction, and that the new direction it assumed was determined by its position in *relation to the wire* and to the direction of the current *transmitted along the wire.*

Thus, if a needle be inclosed in a wire not touching it at any point, and a current of electricity pass through the wire, the needle will be made to move in accordance with the direction of the current.

What other important discovery was made about the same time?

It was found that if a piece of soft iron, not possessing magnetic power sufficient to elevate a grain weight, be placed within a coil of copper wire through which a galvanic current is passing, it will become, through the influence of the current, a *powerful magnet;* and will, so long as the current flows, sustain weights amounting to many hundreds of pounds.

Is the magnetic power of the bar found to be wholly dependent on the existence of the current?

It *is;* the moment the current stops, the weights *fall away* from the bar in obedience to the law of gravity.

How great weights have been lifted by magnets formed in this manner?

An electro-magnet constructed by Prof. Henry was capable of elevating and sustaining about a *ton weight.*

Upon what principle does the construction of the Morse magnetic telegraph depend?

Upon the principle that a current of *electricity* circulating about a bar of soft iron is capable of *rendering it a magnet.*

Why is it necessary, in conveying the telegraph wires, to support them upon glass or earthen cylinders?

These are used for the purpose of insuring the perfect *insulation* of the wires, since but for this the electricity would pass down a damp pole to the earth, and be lost.

Is there any truth in the idea that many persons have, that some principle passes along the telegraphic wires when intelligence is transmitted?

This supposition is *wholly erroneous;* the word current, as something flowing, conveys a false idea, but we have no other term to express electrical progression.

How can we gain an idea of what really takes place, and of the nature of the influence transmitted?

The earth and all matter are *reservoirs of electricity;* if we disturb this electricity at Boston by voltaic influence, its pulsations may be felt in Chicago. Suppose the telegraphic wire were a tube, extending from Boston to Chicago, filled with water. Now, if one drop more is forced into it at Boston, a drop must fall out at Chicago, but no drop was caused to pass from Boston to Chicago. Something similar to this occurs in the transmission of electricity.

What was the earliest important industrial application of electricity?

One of the earliest industrial applications of electricity was to the driving of street cars. The first electric railway was installed by Siemens, of Berlin, in 1882; and the system was quickly taken up and brought to a high state of development by American engineers. It is remarkable that the system of traction early adopted is the one generally used in America and Europe until the present date. It consists essentially of (*a*) a supply of *continuous current* at five hundred to five hundred and fifty volts, generated in (*b*) a *central powerhouse*, and transmitted to the car by means (*c*) of *overhead conductors*, whence by contact with a trolley wheel on a pole on the car it is led down to (*d*) *two series-excited motors*, which are placed electrically first *in series* with one another *at starting*, and then *in parallel* with one another when a sufficient speed has been attained.

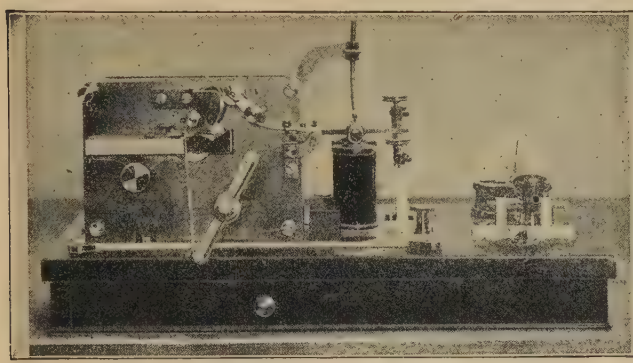
To what well-known electrical machines did this give impetus?

Electric *dynamos* and motors. All such machines will convert the energy of mechanical motion into that of electricity in motion, or the reverse. The former conversion is done by *dynamos*, to which power is given by steam-engines or other such prime-movers, and made to generate in conducting circuits alternate or direct currents of electricity. *Motors*, on the other hand, receive the energy of electrical currents, either alternate or direct, and this produces motion of certain parts of the structure.

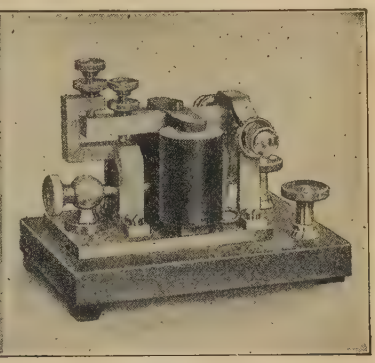
The theory of the action of a dynamo was first discovered by Faraday in 1831; it is intimately associated with that of a motor, for the principle of conservation of energy points out that either machine is reversible—that is to say, a dynamo may be used as a motor or a motor as a dynamo, though perhaps not so efficiently as when each fulfills the special function for which it was designed.

The Current in a Dynamo or Motor.—This brings us to the production of an electric current by the dynamo. In the dynamo we have a coil of wire moving across a magnetic field, alternately passing into this field and out of it. A magnetic field is produced, as we have

THE TELEGRAPH AND ITS WONDERFUL INSTRUMENTS



THE MORSE DIRECT INKING PRINTER



THE MORSE SOUNDER

A • —	J • — — —	S • • •	2 • • — — —
B — • • •	K — • —	T —	3 • • • — —
C — • — •	L • — • •	U • • —	4 • • • • —
D — • •	M — —	V • • • —	5 • • • • •
E •	N — •	W • — —	6 — • • • •
F • • — •	O — — —	X — • • —	7 — — • • •
G — — •	P • — — •	Y — • — —	8 — — — • •
H • • • •	Q — — • —	Z — — • •	9 — — — — •
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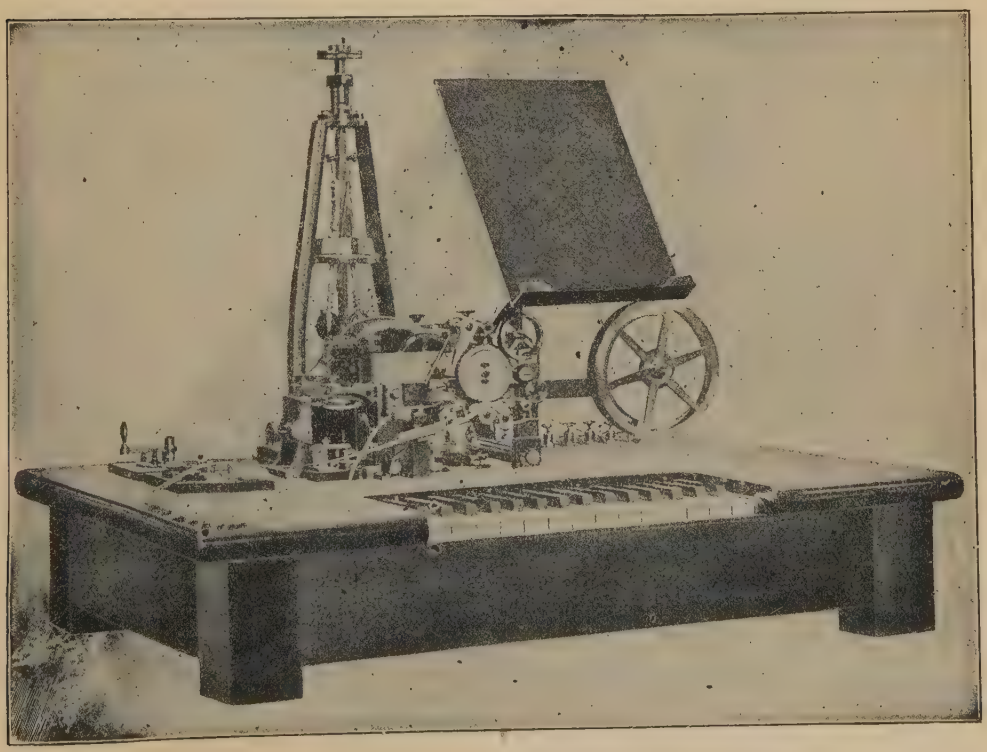
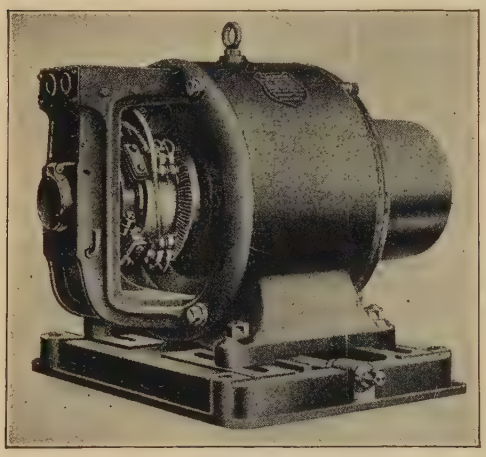
THE MORSE TELEGRAPH CODE FOR LETTERS AND FIGURES



MODERN TELEGRAPHIC TYPEWRITING ATTACHMENT

just seen, by the steady movement of electrons, and we may picture it as being a region of the ether disturbed or strained by the effect of the moving electrons. When the coil of wire passes into the magnetic field, the electrons of its atoms are influenced powerfully and set in motion in one direction, so producing a current in the coil. As the coil passes away from the field, its electrons receive a second impetus, which checks their movement and starts them traveling in the opposite direction, and another current is produced. The coil moves continuously and regularly, passing into and out of the magnetic field without interruption; and so we get a current which reverses its direction at regular intervals, that is, an *alternating* current.



A GOOD TYPE OF DYNAMO

What are some of the chief modern applications of electricity?

The field of applied electricity is one of the most extensive in modern science, invention and industry. Electricity in some form is now utilized in connection with lighting, telegraphy, the telephone, heating, motor boats, railways, aëroplanes, in metallurgy and the arts, clocks, bells and alarms, wireless telegraphy and telephony, submarine telegraphy, automobiles, cooking and domestic science, in medicine and in military science.

Give a brief account of wireless telegraphy.

In the case of ordinary telegraphy we always make use of extended metallic wires or conductors from the place from which the message is sent to the neighborhood to which it is desired to send it. In the case of *wireless* telegraphy no such conductors exist.

Among the most interesting of the many systems of wireless telegraphy now in vogue the modern Marconi, the De Forrest, the Fessenden, and the Poulsen are noteworthy. It is, however, with the name of Marconi that the introduction of wireless telegraphy will always be directly associated.

In 1888 Hertz had demonstrated in a remarkable series of experiments the existence of electro-magnetic waves, and had even shown how these might be produced, detected, and made to exhibit all the chief phenomena of wave-motion. Marconi's great achievement lay in so controlling and regulating the dispatch and receipt of such waves as to make them record signals on a specially designed apparatus in accordance with the well-known Morse telegraphic system. His method, as first patented in 1896, was briefly as follows:

The Transmitter, by which the electro-magnetic waves were generated and sent off into space in all directions, consisted of a battery connected through a key to the primary of an induction coil whose secondary terminals were joined to two brass balls between which there was a short air-gap. From one of these balls a wire was taken to earth, and from the other an aërial wire was led some distance up in the air. The closing of the primary circuit led to sparks passing across the air-gap, which produced electro-magnetic waves in the ether in exactly the same way as the dropping of a stone into a pool produces a series of concentric ripples.

The Coherer.—To receive and interpret these waves Marconi employed a "coherer" in circuit with a battery and having connection with an aërial wire on the one side and an earth wire on the other. The coherer consisted of a small glass tube not more than, say, two inches long by one-quarter inch in diameter, into the ends of which were fused two platinum wires leading to small metallic electrodes. These electrodes were brought quite near each other, and in the narrow gap between them was placed powdered metallic silver, antimony, etc. The resistance offered by this powder was so high, on account of small air-gaps between the particles, that no current could pass through.

Electro-magnetic waves, however, possess the peculiar property of breaking down the resistance of this powder whenever they impinge upon it. Hence as soon as a wave reached the coherer, the resistance practically vanished and a current passed round the circuit. It was a mere detail to arrange that this current should actuate a relay connected with a telegraphic instrument which would record the signal, and that a hammer would at the same time tap the coherer so as to agitate the powder and "decohere" it, setting up the resistance again for a fresh signal.

Improvements.—Since this system was devised many most important improvements have taken place. One of the most noticeable of these was Sir Oliver Lodge's invention of tuning and syntonizing apparatus by which a transmitter and receiver are tuned to the same periodic oscillation, and thus a number of messages might be operated in the same field without interference. Lodge accomplished this to some extent by adding inductance coils and condensers to the circuits. Various other methods have been adopted to secure syntonization; but the resonance effects obtained are not great enough to make selective signaling certain.

The Generator.—In the modern Marconi system the energy for the transmitter is obtained from a generator working at one hundred and ten volts. The current is led through a key and an improved form of interruptor to the primary of the induction coil, whose secondary terminals communicate with the spark-gap. The spark-gap is in series with a condenser and the primary of a high tension transformer, of which latter one secondary terminal leads to the aërial and the other to the earth wire.

THE DETECTOR.—In the receptor the metallic coherer has been discarded for a magnetic detector. This instrument consists of a small glass tube through which travels an endless band of iron wires, moving round two grooved pulleys. Close to the tube are two permanent magnets, and round it is wound a primary coil consisting of one layer of wire. One end of this coil is led straight to earth; the other passes through a condenser to a tuning inductance coil leading in one direction to earth and in the other to the aërial. Above the primary coil on the glass tube a secondary coil is wound and connects with a telephone receiver. The action is simple. The electro-magnetic waves, reaching the aërial, set up oscillatory currents in the primary which act upon the magnetic field. Currents are thus generated in the secondary, which record the message in the telephone receiver by a series of taps corresponding to the Morse dashes and dots.

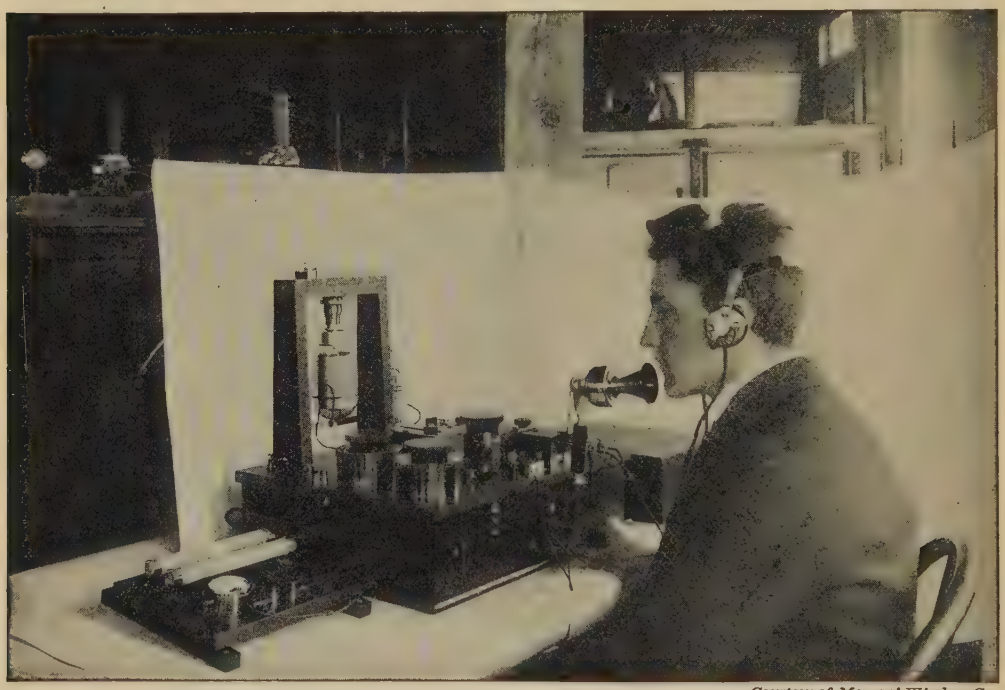
The *De Forrest system* is very largely used in the United States, Japan, and elsewhere, and in its more recent modifications secures a high efficiency by means of a number of ingenious improvements.

Describe the wireless telephone.

As in wireless telegraphy, all modern systems of wireless telephony are based upon the action of electro-magnetic waves. It is impossible here to discuss all the various methods that have been devised, but the leading principles employed may be indicated, with special reference to some of the best-known systems. They may be classified according to the methods in which the waves are produced.

SPARK DISCHARGE SYSTEMS.—These rely for the generation of the Hertzian waves upon a spark discharge across an air-gap. The *De Forrest system* is perhaps the most popular of this type. In this system the spark discharge is utilized to produce waves of a frequency not less than one hundred thousand per second, the resulting sound being inaudible at the receiving station.

A microphone transmitter is employed with this apparatus. When the operator speaks into the transmitter, the variations of resistance act upon the waves in such a way as to produce a new series of waves of such frequency as to be audible at the receiver.



Courtesy of Marconi Wireless Co.

TELEPHONING FROM NEW YORK TO SAN FRANCISCO BY WIRELESS

The receiving apparatus includes the usual antenna, and closed secondary circuit, comprising an inductance and a variable capacity, across the terminals of which an Audion delicate detector is introduced. This instrument depends upon the motions of the ions in a rarefied gas. It is one of the most sensitive detectors yet invented, and offers the great advantage of a practically total absence of time lag in recovery.

SINGING-ARC SYSTEMS.—Duddell's discovery of the singing arc in 1909 has been quickly followed by its application to radio-telephony and radio-telegraphy, first by Poulsen and subsequently by Fessenden, Stone, De Forrest, and others. Under certain conditions the electric arc can be made to emit a musical note, while at the same time it transforms a portion of the energy of its own direct current into oscillations. These are led into an oscillation circuit containing a condenser and inductance, and associated with

an antenna and earth line. The microphone transmitter may be included in a circuit associated with the inductance, in which case the voice acting on the resistance of the transmitter causes variations in the oscillating currents; or it may be associated with some part of the direct-current circuit, in which case it acts by affecting the current passing across the arc.

Any form of receiver may be used with this arc apparatus. The great advantage of this method is that the arc produces continuous oscillations of constant amplitude, and that the wave-length and frequency of the oscillations are subject to better regulation and control.

ADVANTAGES.—The advantages of wireless telephony over wireless telegraphy are many. One is that no skilled operator is required to translate the dot-and-dash signals; for in the latter one hears only long and short buzzes, whereas in the former one hears the actual spoken words. By means of wireless telephony the transmission of intelligence is far more direct and expeditious, and in times of emergency this not unfrequently becomes a very vital question indeed. An important characteristic of wireless telephonic communication is the exceptional clearness of the articulation, owing to the absence of the electrostatic capacity of metallic lines and cables which is always present in wire telephony.

Stronger currents, improved sending and receiving apparatus, and the application of new principles have now greatly extended the speaking range; and only recently distinct communication has been established by wireless telephony between New York and San Francisco. The use of the wireless telephone will be greatly extended, especially in naval, military, and shipping communication.

THE MARVEL OF X-RAYS

Röntgen or X-Rays, the most famous, and up to now by far the most useful, kind of rays associated with high vacuum tubes, were discovered by Professor W. K. Röntgen in 1895. His first observation was that a photographic plate, which was enclosed in an opaque material and which was lying by chance near the apparatus, was affected just as if it had been exposed to ordinary light. This caused him to conclude that the effect must be due to some unknown kind of rays, and the uncertainty as to their character led him to provisionally apply to them the name of X-rays, for x in algebra generally denotes the unknown quantity.

The later sensational part of his discovery was that the property possessed by a highly exhausted bulb of glass, fitted with suitable electrodes, sends out rays or electric discharges capable of passing through many bodies which are quite opaque to ordinary light, and of either affecting a photographic plate or causing a screen coated with certain chemicals to fluoresce or light up under their influence.

How are X-rays produced?

X-rays are thus produced by the discharge of a high-potential current through a special form of vacuum tube, known as a Crookes' tube. The positive terminal of an induction coil or Wimshurst machine is connected to the anode and the negative to the cathode of the tube. The anticathode is connected to the anode and is also positive. The vacuum of a tube is not

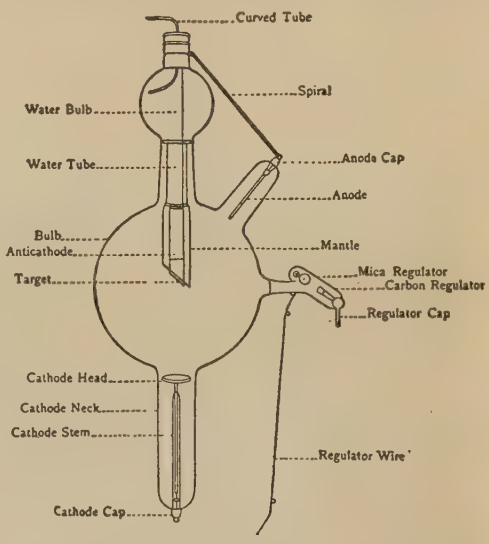


DIAGRAM SHOWING PARTS OF X-RAY TUBE

perfect, and the current is conveyed through the tube by the infinitesimal quantity of air contained therein.

The "cathodal rays" which pass from the cathode to the anticathode consist of infinitesimal particles traveling at a high rate of speed; when the progress of these minute bodies is arrested, X-rays are produced. The green fluorescence on the sides of the tube opposite the anticathode, though not caused by the X-rays, demonstrate their presence.

WHAT THE X-RAYS ARE.—The X-rays are ethereal vibrations traveling with much the same velocity as light. They travel in a straight line in all directions from the point of origin, and are almost incapable of reflection or refraction.

X-rays are invisible to the eye, but have the property of rendering fluorescent certain substances—for example, calcium tungstate and barium platino-cyanide. When a screen coated with these substances is placed near the X-ray tube in a darkened room, the tungstate or barium surface emits a fairly bright fluorescence. If an object such as the hand or a lead pencil is placed between the screen and the tube, the denser parts (the bones or the graphite) appear as black shadows in a gray background.

X-rays penetrate all substances to a greater or less degree, although heavy metals, such as lead and mercury, are, for photographic or visual purposes, practically opaque to the rays.

The greater part of X-ray examination is conducted by photographic methods, as the image given by the rays on a dry plate or film show far more detail than can be seen by visual examination with the fluorescent screen.

APPARATUS.—The apparatus required consists of a suitable source of electrical energy, such as a battery or dynamo, etc., and a powerful induction or a large electrostatic influence machine, combined of course in either case with

an X-ray tube and special X-ray photographic plates. Ordinary photographic plates can be used, but do not give such brilliant results. If we wish to take a radiograph of the hand, we must first of all use a plate slightly larger than the hand, and enclose it in an opaque envelope. Two such are usually employed, one red and the other black. This is placed on the table or stand, film side uppermost, and the hand is placed upon it, and a short distance above the hand is located the X-ray tube. Since what we really take is a shadowgraph picture, to give a good sharp outline, the hand should be placed as flat as possible on the plate, and the tube some six to eight inches from it.

With some of the most powerful apparatus now in use, even the human trunk can be radiographed in a single flash, which is an improvement on the exposure necessary in the early days of its use, when ten, twenty, or even forty minutes' exposure was no uncommon practice.

The Fluorescent Screen.—When the X-rays impinge on certain substances they cause them to light up or "fluoresce" under their action. The number of bodies or chemicals which do so is very large, but for practical purposes only one or two are of any use. The best, and the one always employed, is a chemical known as barium platino-cyanide. The screen-holder consists of a box, preferably of pyramidal form, with a flattened apex or top. Inserted in this apex are two tubes, like opera-glass tubes but without lenses; through these we can look into the box in such a manner as to prevent any outside light from entering. The bottom of the box consists of the screen proper, a piece of cardboard or other suitable substance, one side (the inner) of which is coated with the substance mentioned above, because the light rays given off by the barium platino-cyanide under the action of the X-rays cannot of course penetrate an object opaque to light. The box should be absolutely light-tight except for the eye-tubes.

If such a screen be held in the neighborhood of an X-ray tube, opposite the most brilliantly phosphorescing half of the tube, it will be found to be lighted up under the action of the X-rays. If now we place between the tube and the screen an object such as the hand, putting it in as close proximity to the tube as possible, we obtain a shadowgram on the screen, varying in intensity according to the relative transparency of the different parts of the hand to the X-rays. Since the bones are far less transparent than the flesh, they cast a much denser shadow and are very distinct. On such a screen it is possible to see the beats of the heart, the rising and falling of the diaphragm, etc.

X-rays at Work.—In medical X-ray work, the patient is placed upon a couch consisting of a wooden frame covered with canvas. A box containing the tube moves on wheels and rails beneath the couch; it is lined with metal to shield the operator from the X-rays. The time of exposure depends upon the strength of current used, the power of the coil, and the condition of the tube. A "hard" tube—that is, a tube with an extremely high vacuum—requires less exposure than a "soft" or low-vacuum tube.

The condition of the tube is ascertained by finding its "equivalent spark gap." While the coil and tube are working, the terminal points of the induction coil are slowly brought together. If a spark passes between the points while they are six inches or more apart, the vacuum is too high. If no sparking takes place between the terminals till they are within three inches of each other, the tube is low. A good working spark gap distance is four and one-half inches. A soft, or low-vacuum, tube gives better definition than a hard, or high-vacuum, tube, as the rays pass less easily through dense substances and show greater differentiation of tissue. A very high vacuum tube may show but little difference between the bones and flesh, while a soft tube should give the minute structure of the bones.

Time of Exposure.—With a current of five amperes at one hundred volts passing through the primary winding of a ten-inch coil, the exposure for a hand or foot would be from three to fifteen seconds. The exposure for the thicker portions of the body would be from twenty seconds to two minutes. If an electrolytic break is used, about half the exposure would be required. Dry plates with extra thick sensitive films are specially prepared for radiography, the development and fixation being the same as in ordinary photography. The image is sometimes barely visible on the surface of the plate during development, but when fixed the negative may give good density and definition owing to the penetration into the film of the X-rays.

Kinds of X-rays.—It is now known that these rays are not all by any means of the same kind or of the same penetrative power. Moreover, these differences can be still augmented by altering what is known as the induction in the circuit, the degree of exhaustion in the tube, and the nature of the emitting surface. The emitting surface is not the glass walls of the tube, as many suppose; and the canary colored light emitted by the tube is not the X-rays, which are themselves invisible. They originate from the anode of the tube owing to the fierce bombardment to which the cathode rays subject it. Where the cathode rays, which travel in straight lines, first strike any material object, from that same object the X-rays originate.

Uses of X-rays.—In the early days of radiography the X-rays in medical work were confined almost solely to the detection of fractured or injured bones, and abnormal bone growth. At the present time, however, even a careful examination on the fluorescent screen is sufficient to enable an expert medical radiographist to diagnose with a considerable degree of exactitude the condition of the heart, the lungs, and the stomach. In making such examination a tube must be chosen which has the lowest vacuum, in order to obtain the maximum amount of contrast between fleshy tissue not differing greatly in density.

In some cases even the liver has been outlined and part of the kidneys.

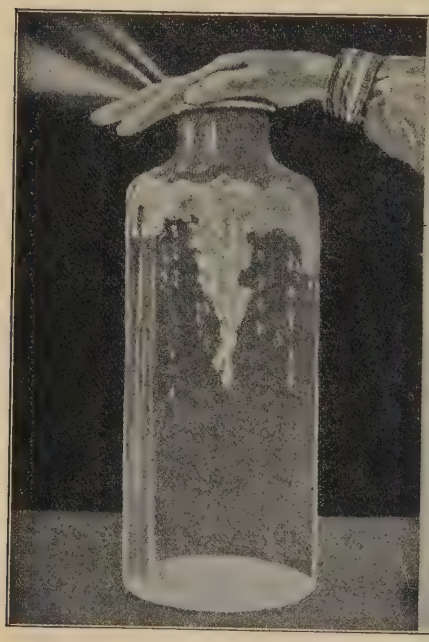
Still more important is the fact that the rays have been applied successfully in the treatment of certain diseases which by other means have been deemed, if not incurable, at any rate extremely difficult to cure. Claims have been made for cancer cures by means of these same rays; whether these have really been complete cures or not is perhaps open to question.

X-ray Dermatitis.—A painful and incurable disease, of a cancerous nature, to which radiographers are liable, caused by frequent and prolonged exposure to X-rays. Many of the pioneers of radiography have fallen victims to this complaint, but greater precautions are now taken to protect the operators from the X-rays. There is little danger of contracting this disease in X-ray photography, as the exposures are short and the operator need not stand directly in front of the tube. The chief risk is entailed by visual examination with the fluorescent screen. The disease first makes its appearance in the hands and gradually spreads to the arms and body. The skin at first appears as if it had been burned hence the term "X-ray burning."

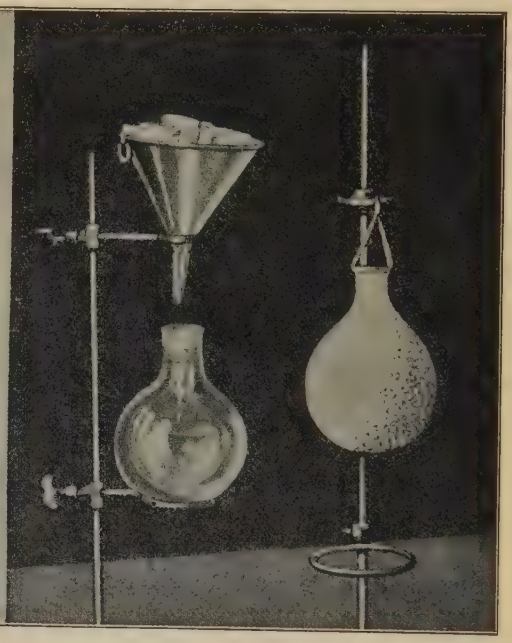
THE LIGHT THAT REVEALS THE UNSEEN IN THE HUMAN BODY

Illustration and diagram showing the apparatus ordinarily used in X-ray photography, together with the course of the electric circuits, and a radiograph of the hand.

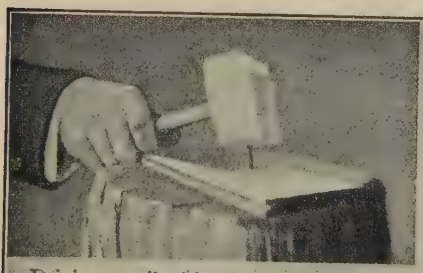
LIQUID AIR AND ITS MARVELS OF LOW TEMPERATURE



Liquid Air in water. The silvery bubbles are liquid oxygen; the nitrogen boils away.



Filtered Liquid Air in a Dewar bulb, and Liquid Air in an ordinary glass bulb (which has collected a coating of frost).



Driving a nail with a hammer made of mercury frozen by Liquid Air

Liquid Air boiling on a block of ice, caused by the difference of temperature.

Burning steel in an ice tumbler partly filled with Liquid Air.

Liquid Air is simply its gaseous form brought into liquid condition by the combined effect of lowering its temperature and subjecting it to an extreme expansion. When protected from external heat and highly exhausted it becomes a transparent, jelly-like, mass. By means of liquid hydrogen it may be condensed into a white solid with a faint blue tint.

BOOK OF THE HUMAN BODY

WHAT THE HUMAN BODY IS

ITS DIVISIONS AND SYSTEMS

GENERAL STRUCTURE OF THE BODY

FRAMEWORK: Bones, Muscles and Cells

THE DIGESTIVE SYSTEM AND ORGANS

CIRCULATION OF THE BLOOD AND RESPIRATION: Heart, Blood Vessels, Lymphatics, Lungs and Bronchii

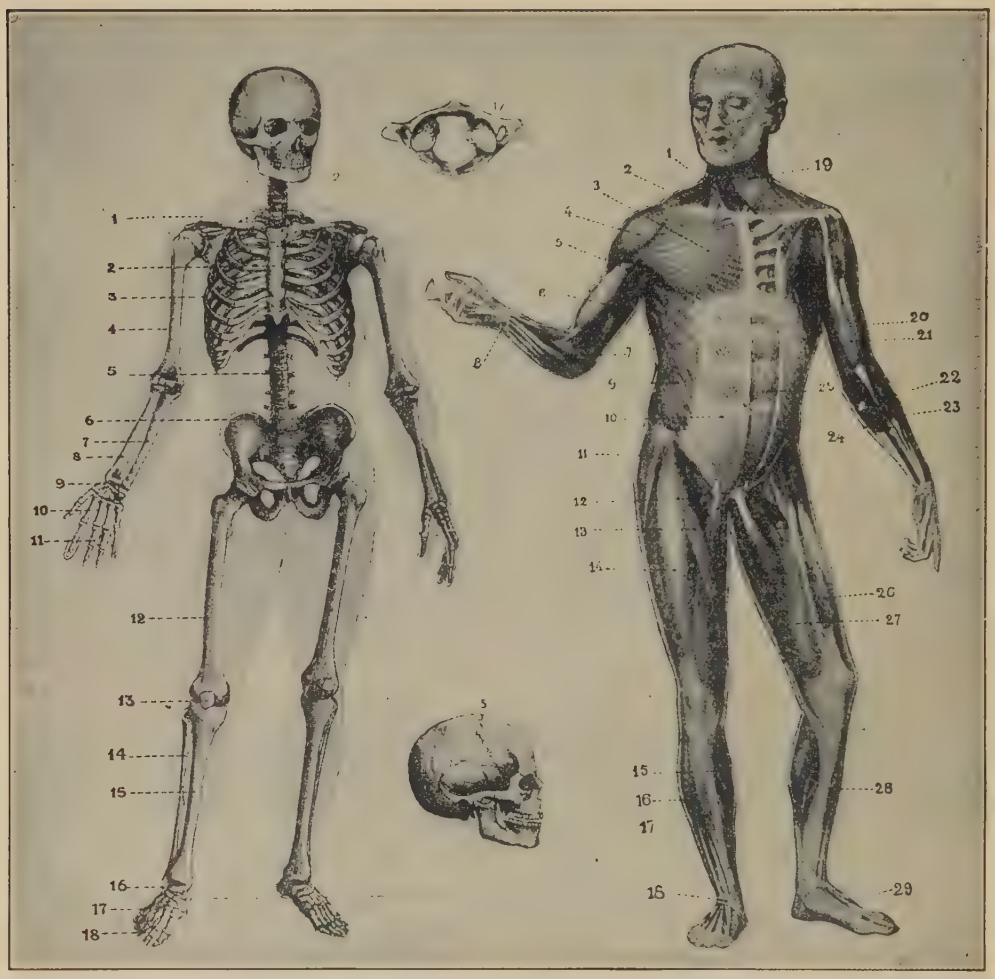
THE EXCRETORY SYSTEM: Intestinal Tract, Kidneys, Sweat Glands, Lungs

THE NERVOUS SYSTEM: Nerves, Brain, Spinal Cord

ORGANS OF SPECIAL SENSE: Eye, Ear, Nose, Tongue, Hand and Skin

CHARTS, TABLES AND SPECIAL FEATURES

THE FRAMEWORK AND MUSCLES OF THE HUMAN BODY



PRINCIPAL BONES OF THE BODY

1. Collar Bone. (Clavicle)
2. Breast Bone. (Sternum)
3. Ribs.
4. Arm Bone. (Humerus)
5. Lumbar Vertebra.
6. Haunch Bone. (Pelvis)
7. Ulna.
8. Radius.
9. Wrist. (Carpus)
10. Metacarpus.
11. Phalanges.
12. Thigh Bone. (Femur)
13. Knee Cap. (Patella)
14. Brooch Bone. (Fibula)
15. Shin Bone. (Tibia)
16. Tarsus.
17. Metatarsus.
18. Phalanges.

PRINCIPAL MUSCLES OF THE BODY

1. Sternoclidomastoid (the muscle that bends the head).
2. Trapezius.
3. Pectoralis (chest muscle).
4. Deltoid (arm lifting muscle).
5. Coraco brachialis (rudimentary arm muscle).
6. Triceps (forearm extension).
7. Pronator radii teres (turns forearm and hand).
8. Annular ligament of wrist.
9. External oblique of abdomen.
10. Muscular sheath of abdominal erectus muscle.
11. Tensor fasciæ latæ (fibrous muscle covering thigh muscles).
12. Gluteus (controls thigh and helps to keep body erect).
13. Sartorius, or tailor, muscle (enables legs to be crossed).
14. One of quadriceps extensor cruris muscles.
15. Gastrocnemius (bends the knee).
16. Long extensor of toes.
17. Peroneus longus (helps to keep foot arched).
18. Annular ligament of ankle.
19. Platysma.
20. Brachialis (moves elbow joint).
21. Biceps (flexor of arm).
22. Supinator longus (turns hand).
23. Extensor carpi radialis (extensor of forearm and wrist).
24. Flexor carpi radialis (bends wrist and turns hand).
25. Rectus abdominis (retracts abdominal wall).
26 and 27. Vastus externus and internus. These, with 14 and an abductor muscle, together make up the quadriceps extensor, the largest muscle in the body. It extends the leg.
28. Tibialis (extends the ankle).
29. Extensors of the toes.

The bones which make up the framework of the body are held together by joints of different kinds which allow of widely varying ranges of motion. The skull, which contains twenty-two bones in all, includes the cranium which contains the brain, and the bones which form the framework of the face. The vertebral column, which acts as a hinged and pliable tube down the center of which runs the spinal cord, is made up of twenty-four true vertebræ and the sacrum and the coccyx. The thorax, the bony box or cage protecting the heart and lungs, is made up of the twelve dorsal vertebræ with the twelve ribs on each side and the sternum or breast bone in front. The upper extremities consist of the shoulder-blade or scapula, the collar-bone or clavicle, the humerus or upper arm bone, the two fore-arm bones (radius and ulna), and the twenty-seven bones of the hand and wrist. The pelvis is composed of the two hip bones, together with the sacrum and coccyx. The female pelvis is larger in all diameters than the male. The bones of the lower extremity, which is joined to the pelvis by the head of the thigh bone (the femur), making a ball and socket joint at the acetabulum, are the two bones of the leg, the tibia and fibula; the patella or knee-cap; and the twenty-six bones of the ankle and foot.

BOOK OF THE HUMAN BODY

The study of the Human Body involves numerous other branches of science, and, as a whole, is the most complex and intricate of all the sciences. To explain its structure and workings we apply the principles of Biology, Physiology, Chemistry, Physics, Psychology, and Metaphysics.

The individual man, as a whole, is frequently forgotten both in physiology and in medicine, owing to the extraordinary minuteness and exactness with which each part and organ is examined and described. At the outset, then, it should be remembered that the human body is an organic whole, and what makes it *one* is not the similarity or unity of the machines and processes, for they are unlike and many; but it is the unity of the one governing force, the *mind,* and especially the *unconscious mind,* which presides over the body.

Nothing in the body is merely mechanical, although there is much mechanism; all is vital, all is united in one great aim—the health and well-being of the individual.

All organs and systems are held together and formed into one body by means of a framework, partly fixed and partly movable, partly rigid and partly flexible, partly hard and partly soft.

The *skeleton* part of the framework is made of *bone;* flexibility is given to certain parts by means of joints, which are simply smoothed and rounded ends of bone covered with gristle to avoid friction, and joined together by fiber and ligament for strength. This forms the rigid and hard parts of the framework.

The flexible and soft part, which everywhere covers organs and muscles, is composed of a layer of fat to preserve the warmth, as fat is a non-conductor, and an outer covering of skin.

This framework is exquisitely adapted to give strong protection to the vital parts so that they cannot readily be injured; and the whole of the organs are so arranged and stowed away that a perfect human body is a beautiful object full of symmetry and graceful curves and lines.

Divisions of the Body.—If we divide the body into six parts—four limbs, trunk, and head and neck—we find each part contains about thirty bones (counting the ribs in pairs) there being about *two hundred* in the entire body.

The height of the body depends mainly on the length of the bones of the lower limbs.

Everything in Pairs.—In the body almost everything is paired, right and left, giving it symmetry. There are but five central bones: two in the head, one in the throat, and the breastbone and backbone (or spine); and there are but five single muscles, all the rest—out of many hundreds—being in pairs. In the interior, where economy rather than symmetry is required, it is not so; there being as many single organs as there are double.

The Body Viewed as a Machine.—A favorite way of looking at the body as a whole is to regard it as an anatomical machine. In this view the body has an internal skeleton, of which the chief feature is the central axis or backbone.

Considering the skull and backbone as one, the body may be said to be built up of two tubes. The smaller posterior or neural tube includes the cavity of the skull and the vertebral canal. Within this tube is lodged the nervous center, or engine, of the body. The anterior, or body, tube is much larger, consisting of the face above, and the neck and trunk below, and it contains the *four nutritive systems* of life, so that the whole body in section is like an eight with the lower circle immensely exaggerated. The limbs, of course, are not tubular, and merely form part of the machinery.

Adopting the simile of the human engine and boiler and machinery, we see that the limbs, etc., are the machinery; the posterior tube the engines and force that move them; and the anterior tube the human boiler that generates the force. This boiler, like one in a steam engine, has an upper and lower part. The upper part is where the steam is generated (in lungs) and sent to the engine (the brain) by the heart. The lower part is where the fuel is burned (the stomach) and the ashes and refuse drop through (the intestines). So that the analogy between the two is close and striking.

Centers of Control.—There are two distinct seats of government in the human body: the one in the *upper brain,* or cortex, the other principally in the very center of the human body. That in the upper brain, or cortex, is the human will and the conscious mind. It has absolute control given to it over the animal part of the human life—that is, over the part that consists in the using of force, which includes the nervous and locomotor systems, and the special senses.

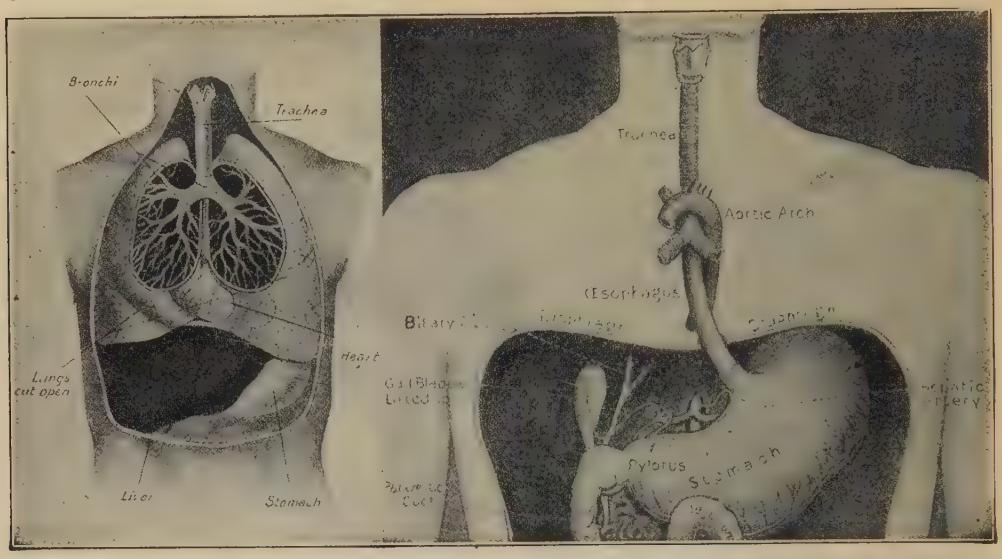
Nutritive Systems.—The other government, situated in the lower part of the brain and spinal cord and in the center of the body—in front of the spine and behind the stomach—is of an entirely different order. To put this more plainly: The four systems that lie in the body—*digestive, circulatory, respiratory,* and *excretory*—may be termed the nutritive systems, being designed for the maintenance and storage of life-forces. They are almost entirely under the control of the involuntary nerve centers, and have full and undisputed sway over life itself—that is, over the generating and storing of vital force, rather than over its usage.

SYSTEMS AND ORGANS OF THE BODY

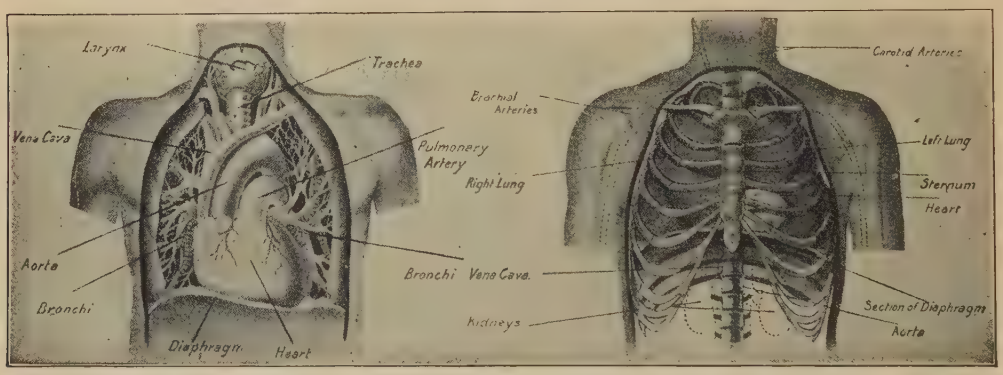
How the Body is Built.—In a building such as the body it is well to begin with the *unit*—the building unit. In a house this is a brick or a stone; in all living structures, animal and vegetable, it is a *cell.*

All living structures, whether animal or vegetable, are built up of cells (which we shall consider in due course), and these cells are grouped together for different purposes to form different tissues. The *tissues* are the different materials of which the body is made. There are eight principal tissues in the body: *bone, gristle, muscle, nerve, skin, fat, fiber,* and *connecting* tissue.

ORGANS OF CHEST CAVITY IN RELATION TO STOMACH



THE BRONCHIAL TUBES ORGANS INVOLVED IN FIRST STAGES OF DIGESTION



DIAGRAMS DISCLOSING HEART AND CONNECTIONS, RIBS AND LUNGS

(1) The *Osseous*, or bone tissue, is the framework of the body. This material is found, of course, in every part of the body and forms the skeleton.

(2) The *Cartilaginous*, or gristle, forms the joints of the body. This tissue covers the ends of the bones to form the joints; it unites the ribs with the breastbone; it forms the rings of the windpipe and the lid of the larynx at the back of the tongue; the lower part of the nose, the upper eyelid, and the ear.

(3) The *Muscular*, or muscle, forms the machinery of the body. This tissue covers all the bones with flesh, which is muscle, and is the chief part of a number of machines by which every movement is performed. It is also an important tissue in the wall of the abdomen and the floor of the chest.

(4) The *Nervous*, or nerve tissue, is the moving power of the body. It is the chief constituent of the brain and the spinal cord, inside the backbone or spine. It also forms the nerves, which run like white threads from the brain to all the muscles, and give them power to move.

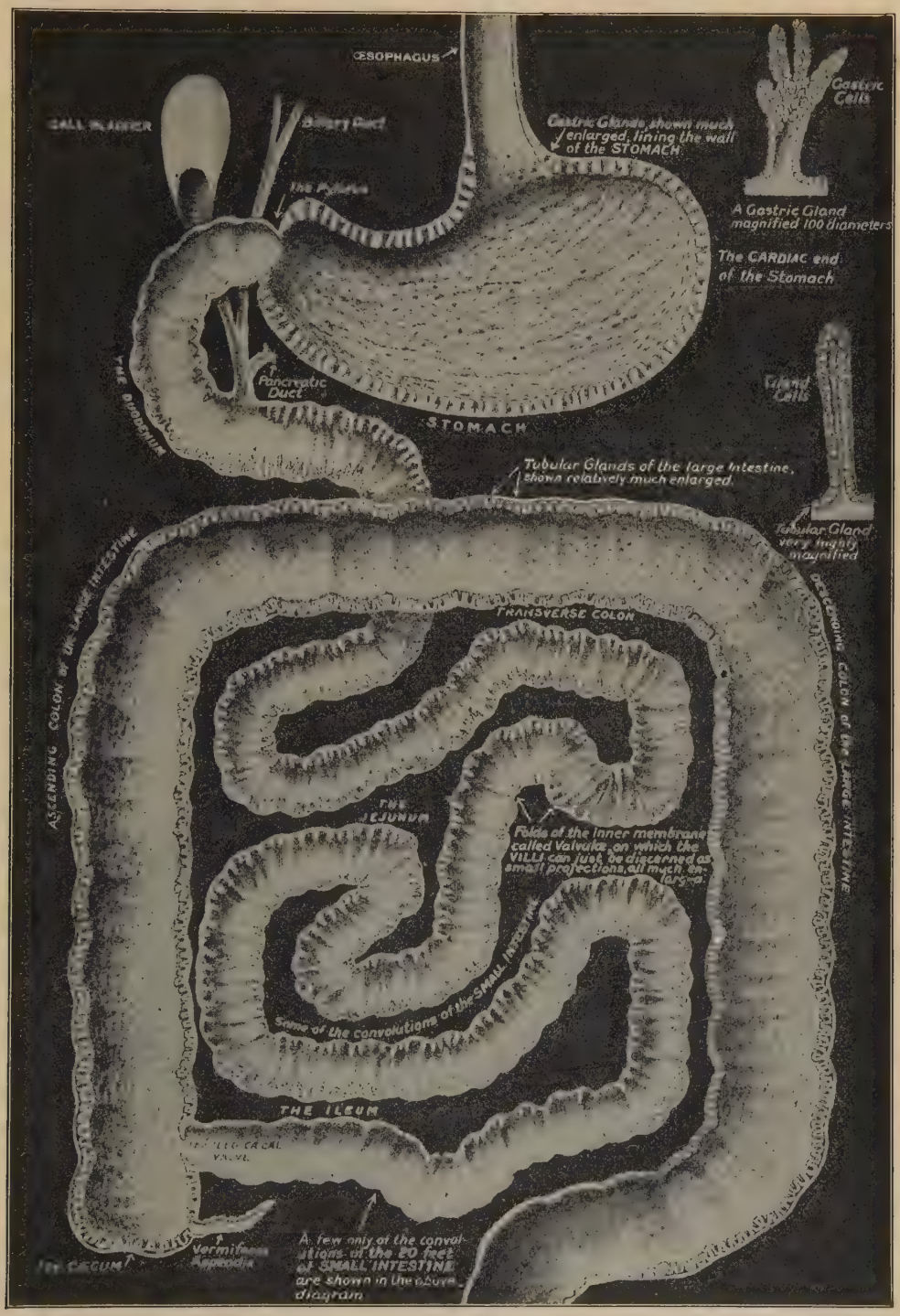
(5) The *Epithelial*, or skin, forms the outer covering of the body. This tissue is the skin that covers the body outside, and lines it as mucous membrane inside, and also forms the teeth and nails.

(6) The *Adipose*, or fat, forms the under covering of the body. This tissue is the inner protective sheathing and padding of the body, beneath the skin, and round the internal organs. It consists of drops of oil, enclosed in separate cells.

(7) The *Fibrous*, or fiber or sinew, is the tissue that forms the cords and bands of the body. This tissue makes the strong tendons that fasten the muscles to the bones, and forms the covering or sheath of the bone itself, and the various organs.

(8) The *Connective*, or cementing tissue, joins all the parts and cells of the body together. This substance is found everywhere, all over the body, and is like the mortar in a house, fastening all the bricks together. It is a sort of network of cells and long fibers.

DIAGRAM ILLUSTRATING THE ALIMENTARY CANAL



Special Systems.—These eight tissues are combined together into various groups of *organs* or *systems* for special purposes. These groups are *six* in number, and include: the *circulatory, respiratory, digestive, excretory or secretory, locomotor*, and *nervous systems*. There is also the *reproductive* system, which has to do with the propagation of the race, and involves many important and vital questions.

We may divide these six into three groups:

There are two in the chest:

(1) The *Circulatory* system is that by which the blood or liquid food is distributed throughout the body to all the tiny cells. This system includes the *heart* or force-pump, and the *arteries*, *capillaries*, and *veins* or the three kinds of pipes through which the blood travels.

(2) The *Respiratory* system is that by which we breathe, and by which the body is fed with oxygen, which gives the blood its bright red color. This system includes the nostrils and mouth, the windpipe and the lungs.

Then there are two in the abdomen, or stomach:

(3) The *Digestive* system, by which all the food is made into liquid and changed so as to nourish the body and pass into the blood. This system includes the mouth, gullet, stomach, liver, pancreas, intestines, and other organs.

(4) The *Secretory*, or excretory, system (for they are best grouped as one) manufactures the various fluids of the body, such as bile, urine, sweat, saliva, gastric juice, etc. It consists of various glands or secretory organs in different parts of the body, such as those in the skin, the kidneys, the lymphatic glands, the spleen, etc. It also gets rid of the refuse of the body.

Lastly, there are two in the head and limbs:

(5) The *Locomotor* system, by which all movement is effected. This includes the bones, joints, and muscles.

(6) The *Nervous* system, by which all the body is controlled, directed, and regulated. This system includes the brain, spinal cord, and the special senses, such as the ear, the eye, and all the nerves.

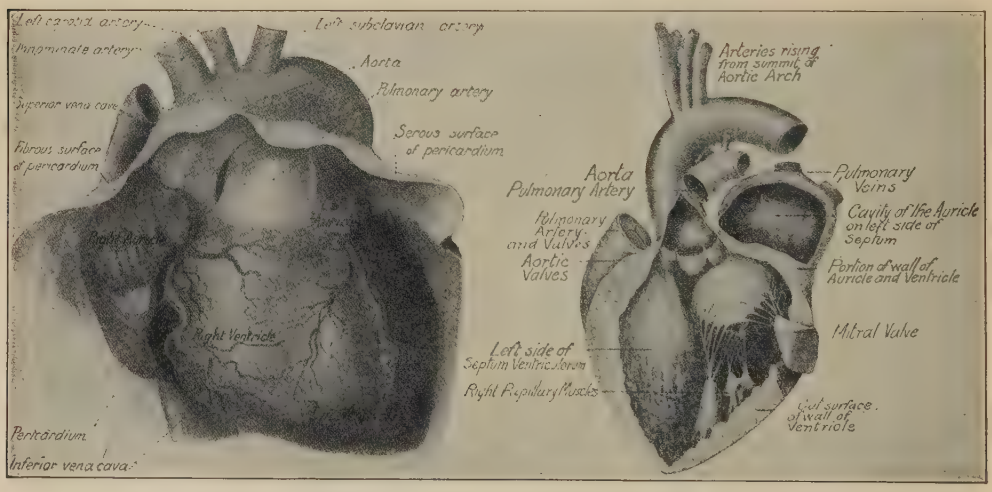
The Human Chest, or Thorax.—In it, the blood is purified and circulated. The *thorax* is closed above and below: above, by the neck, through which the windpipe enters it in front, conveying air to the lungs; and by the *gullet* behind, conveying food to the stomach. Below, the floor, dividing it from the abdomen beneath, is formed by a very large muscle stretching right across the body, called the *Diaphragm*, or partition wall; also called the *Midriff*. The thorax is walled in at the sides by the ribs, and behind by the backbone in which is the other tube that contains the spinal cord. The thorax contains the two organs of *respiration* and *circulation*.

The *lungs* are the organs of respiration. They are like two sponges filling the right and left halves of the chest. Wherever you can feel a rib there is part of the lung underneath. Each of these lungs is contained in a bag, like a skin, that separates it from the ribs, and is called the *pleura* (from *pleuron* = *a rib*), but the lung is not *inside* the bag.

The *outer* layer of the pleura is fixed to the side of the chest, the *inner* layer to the lung, and the two layers move on each other like a joint when we breathe.

The lungs are full of small air-cells with minute tubes leading from them. These gradually increase in size as they join together, till at last they unit in one large tube, or bronchus, for each lung. These two bronchi join together, and form the *windpipe*, or *trachea*, which conveys the air through the larynx into the mouth.

The windpipe is kept stretched widely open by a series of elastic rings of gristle. Behind the windpipe is the gullet, leading to the stomach.

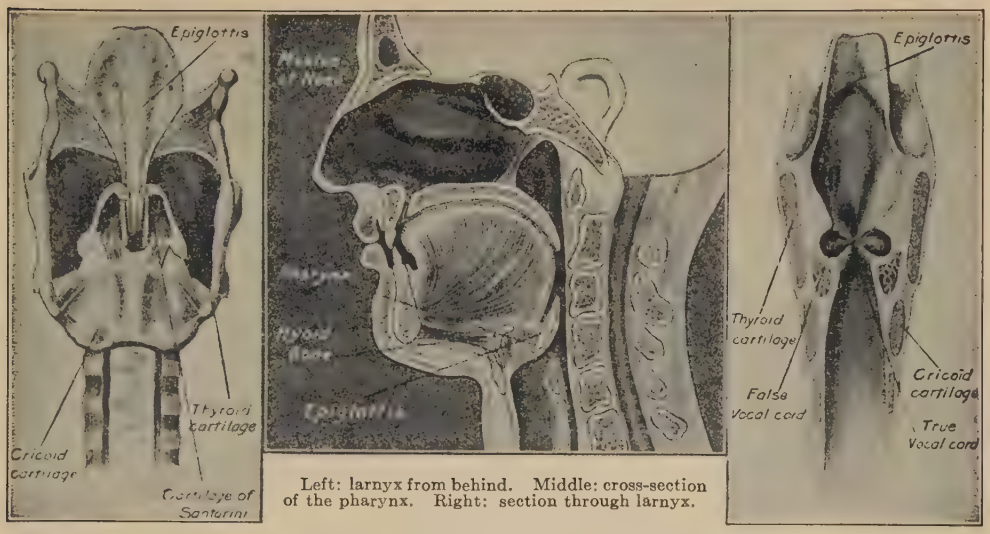


PERICARDIUM OF THE HEART **LEFT AURICLE AND LEFT VENTRICLE**

The heart, the main pump of the circulatory system, rests on the diaphragm between the two lungs. The heart is enclosed in a smooth, moist membrane or sac, the pericardium, which allows it to dilate and contract without friction against the adjoining parts. There are four cavities in the heart, the right and left auricle, and the right and left ventricle. The auricles, which are thinner walled, collect blood from the veins, while the thicker and stronger walled ventricles force the blood into the arteries. The left auricle pumps the purified blood into the left ventricle, the valve between the auricle and ventricle opening to allow this passage. When the left ventricle is full the valve between its chamber and that of the auricle closes, the ventricle itself contracts down, and the blood is pumped out through the aorta to supply all the tissues of the body.

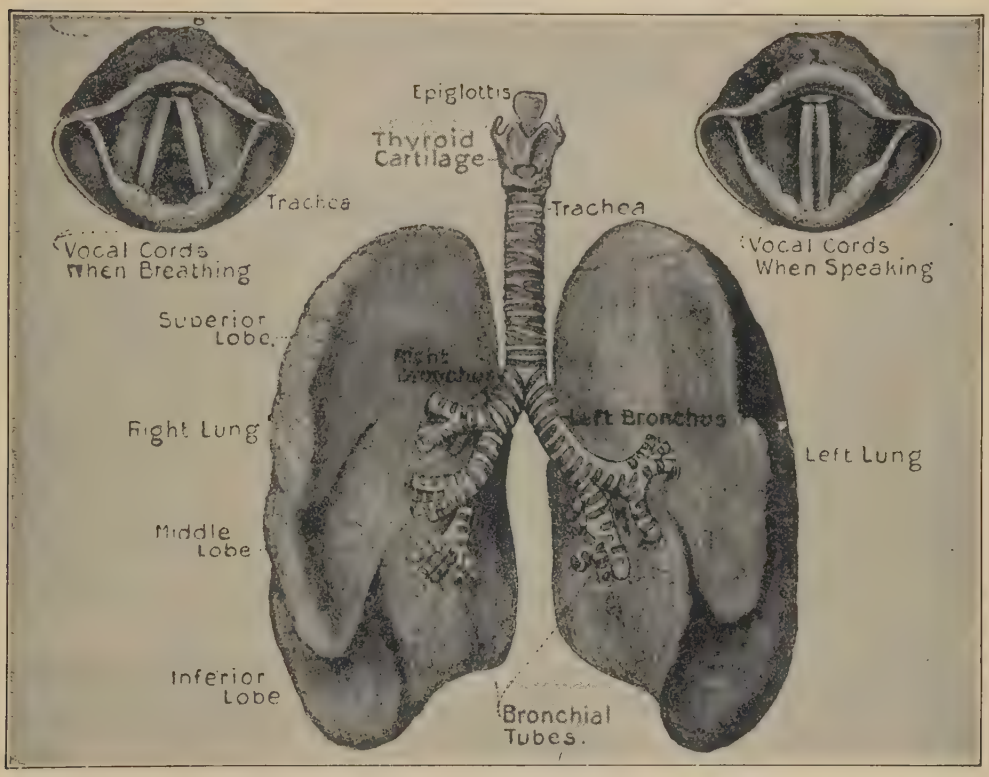
After leaving the left ventricle through the aorta the purified blood is carried to the head, arms, trunk, and lower limbs, etc. Finally, after being deprived of its oxygen as it passes through the tiny end-arteries, or capillaries, of the tissues it has to nourish, it is collected in the veins and is emptied into the right auricle. Passing from the right auricle to the right ventricle, this impure blood, which is of a dull purplish color, is pumped into the lungs, where it is deprived of its waste gases and once more takes up a fresh supply of oxygen. Bright scarlet in color again, it now is collected and carried to the left auricle by the pulmonary veins. From the auricle it passes through the mitral valve to the left ventricle, whence it is once more pumped out through the aorta to supply the tissues.

RESPIRATORY SYSTEM OR AIR PASSAGES OF THE BODY



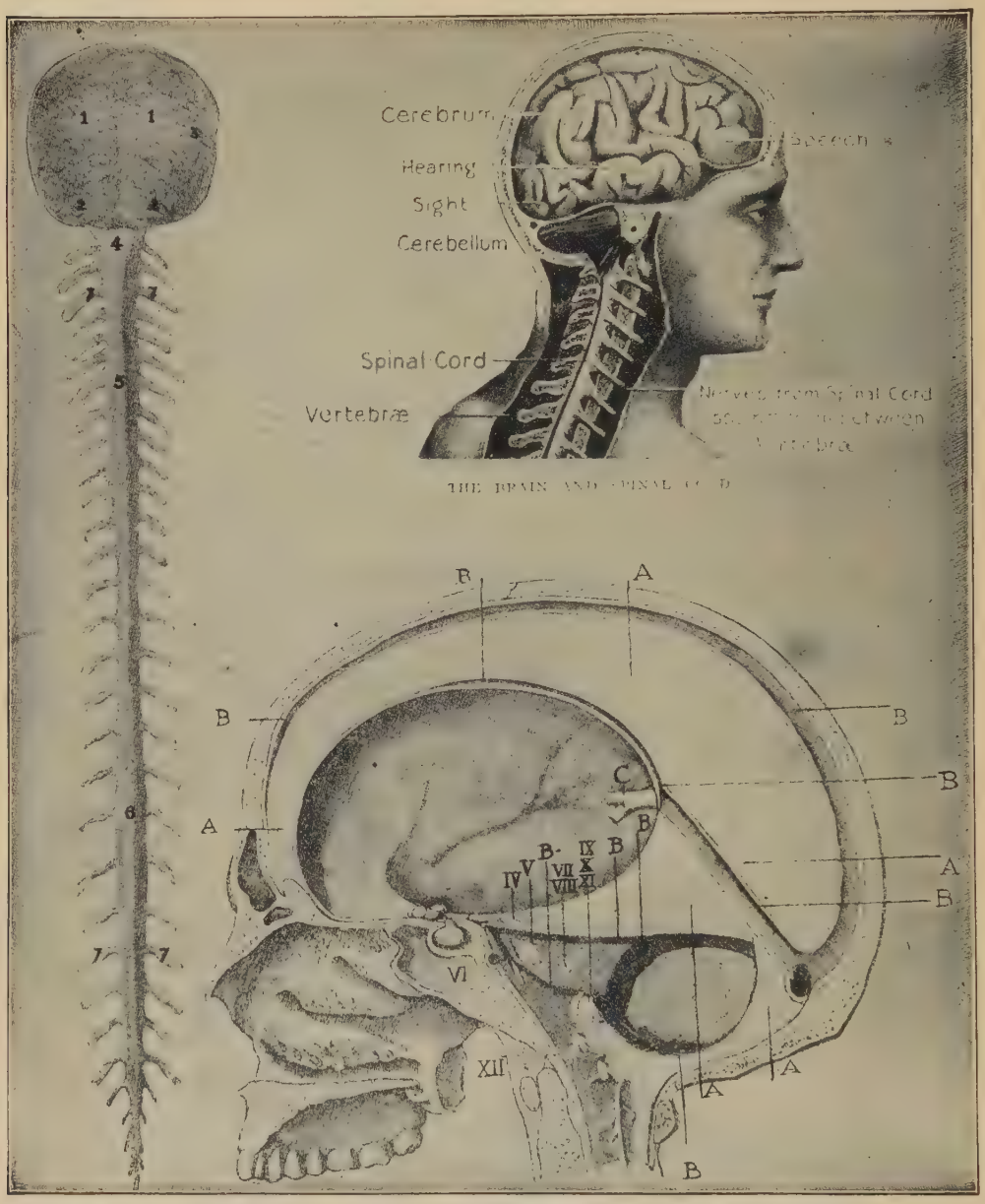
Left: larnyx from behind. Middle: cross-section of the pharynx. Right: section through larnyx.

VIEWS OF THE LARYNX, SHOWING HOW THE AIR REACHES THE LUNGS



The organs of respiration are the nose, throat, larynx. windpipe or trachea, and the two lungs. On the outer walls of the nasal cavities are three shelves known as the turbinated bones, the surfaces of which contain blood-vessels to heat the air as it passes through the nose. The mucus which constantly forms on the lining membrane of the nose and the little hairs in the nostrils, act as screens, preventing dust being breathed into the lungs. The pharynx is the cavity behind the nose, mouth and larnyx. The larynx forms a prominence in the throat known as the "Adam's Apple." It contains the vocal cords, the vibrations of which, as air from the lungs passes through them, give rise to voice sounds. The epiglottis is a cartilaginous curtain above the larynx which blocks up its entrance when food is being swallowed. The trachea or windpipe is a continuation of the larynx. Shortly after entering the chest it divides into two main branches, the right and left branches, which lead to all parts of the lungs. The lungs, two spongy, air-filled organs, take up most of the space in the chest-box or thorax. The smallest end-branches of the bronchial tubes open into numerous tiny sacs known as the air vesicles, in the walls of which the end-branches of the capillaries ramify. Here the impure gases in the blood escape through the vessel walls into the air vesicles, while the oxygen breathed into the lungs is taken up the same way by the blood in the vessels.

HOW THE HUMAN BODY IS CONTROLLED BY THE BRAIN



CORD WITH DURA MATER **THE ARRANGEMENT OF THE DURA MATER**

The nervous system consists of (1) the brain; (2) the spinal cord; (3) the nerves which run off from these structures; and (4) the sympathetic system. The chief mass of the brain is known as the cerebrum, or fore-brain, the small mass at the lower part being termed the cerebellum, or little brain. From the brain, which is contained within the bony skull, twelve pairs of cranial nerves proceed. The most important of these are the first or nerve of smell, the second (sight), eighth (hearing), and twelfth (taste). The fifth, one of the most important nerves of sensation, has three main branches running to the orbit and forehead, the jaws and teeth, and the skin of the face. Six of the twelve pairs of cranial nerves govern the movements of different parts (motor nerves), others have to do with the special sense organs, taste, smell, hearing, and sight (sensory nerves), and others are a combination of motor and sensory nerves. The spinal cord is a continuation of the brain, and is contained in the hollow canal running through the vertebræ of the spine. From it thirty-one pairs of nerves originate. The nerves which run to the arm are collected in a network called the brachial plexus. In the same way the great nerves to the leg come together in the lumbar plexus. The sympathetic nervous system consists of a main nerve trunk running downward along the spine from the skull to the coccyx. This sympathetic system communicates indirectly with the brain and spinal cord, and also with all the great arteries and other important structures in the abdomen.

The dura mater is the strong external cranial membrane which adheres to the skull and also penetrates into the cavities of the brain, dividing it into partially separate compartments. These dividing portions of the dura mater may be seen at A, A, in the diagram above. B marks the various venous blood sinuses of the brain, which receive blood from veins in the different parts of the brain, and, merging into one large sinus (seen at lower right of diagram), afterwards become the jugular vein. C is the great cerebral vein. The Roman numerals mark the great cranial nerves.

We take air into the lungs to pass thence into the blood, and thus be carried to all the cells of the body to enable them to live and breathe.

The Heart.—The *heart* is at the lower part of the chest, between the two lungs. It is a *fleshy* or muscular organ, about the size of the fist—flat above, and pointed below like a sugar-loaf. It lies in a slanting direction behind the breastbone—the broad part, or the *base*, of the heart being upwards and partly to the *right* of the breast-bone; the point, or apex of the heart, being downwards and to the *left*, where it can often be seen beating against the chestwall.

The heart is hollow, and acts like a pump, forcing the blood all over the body through the great vessel that leaves the heart at the upper part. The heart, like the lungs, is enclosed in a double layer of folded bag, called the *pericardium*, because it is round the heart.

The *gullet* runs right down the back of the thorax, and passes out through the diaphragm, which forms the floor, into the abdomen.

The *abdomen* forms the lower half of the trunk, and is often called the *stomach*. It is full of organs belonging to the *digestive system* and *secretory system*, by which the fuel or food is rendered fit for use in the blood and the body.

The *walls* of the abdomen are not protected by ribs like the thorax, but are all formed of flesh or muscle. The principal organs they contain are the *stomach*, the *liver*, the *pancreas*, or *sweetbread*, the *spleen* or *milt*, the *kidneys*, the *intestines*, and the *bladder*.

The Human Brain.—The *head* and *spine* contain the principal nervous systems of the body and four organs of special sense—*sight*, *hearing*, *smelling*, and *tasting*.

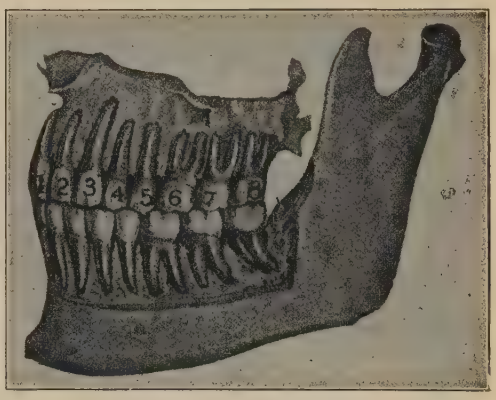
The *brain*, which fills the head, consists of two parts: the *Cerebrum*, or greater brain, and the *Cerebellum*, or lesser brain, placed behind and below the larger one. From this brain, nerves run to every muscle of the body, enabling them to move the limbs and body as the mind directs; and another set of nerves run from every part of the body and skin to the brain, enabling the mind to know and feel all that goes on.

The brain is connected with the spinal cord by a flat band of brain matter, that lies on the inside of the occipital bone, called the *Medulla Oblongata*, or the Oblong Marrow. The *spinal cord* runs through a large hole in the occipital bone and right down the open tube formed by the spinal vertebræ, to the bottom of the backbone, and, all along its course, nerves leave it and enter it, as in the brain.

The *organ of sight* consists of the *two eyes*, which receive every image that we see, and transmit it to the brain. The *organ of hearing* consists of the *two ears*, by which we receive all the waves of sound that we hear, and transmit them to the brain. The *organ of smell* is in the upper part of the *nose;* the *organ of taste* at the hinder part of the *tongue*.

The *organ of the voice* is contained in the *larynx* in the neck, which joins the head to the body. Just under the chin in front of the neck you can feel what is called the *Adam's Apple*, which is the front of the larynx, or voice-box, by which the air coming out of the lungs is formed into sounds.

The *sounds* are formed into words by the *mouth*, *tongue*, and *teeth*.



PERMANENT TEETH AND THEIR NAMES

UPPER JAW: 1, 2, incisors; 3, canine; 4, 5, premolars; 6, 7, 8, molars.

LOWER JAW: 1, 2, incisors; 3, canine; 4, 5, premolars; 6, 7, 8, molars.

THE FIVE GATEWAYS OF KNOWLEDGE

These gateways—which we otherwise name the Organs of the Senses, and call in our mother speech, the Eye, the Ear, the Nose, the Mouth, and the Skin—are instruments by which we *see*, and *hear*, and *smell*, and *taste*, and *touch:* at once loop-holes through which the soul gazes out upon the world, and the world gazes in upon the soul.

THE EAR: THE MARVELOUS ORGAN OF HEARING

The ear is divided into three parts:

(1) The external ear, made up of the outer portion and passage-way which leads up to the drum.

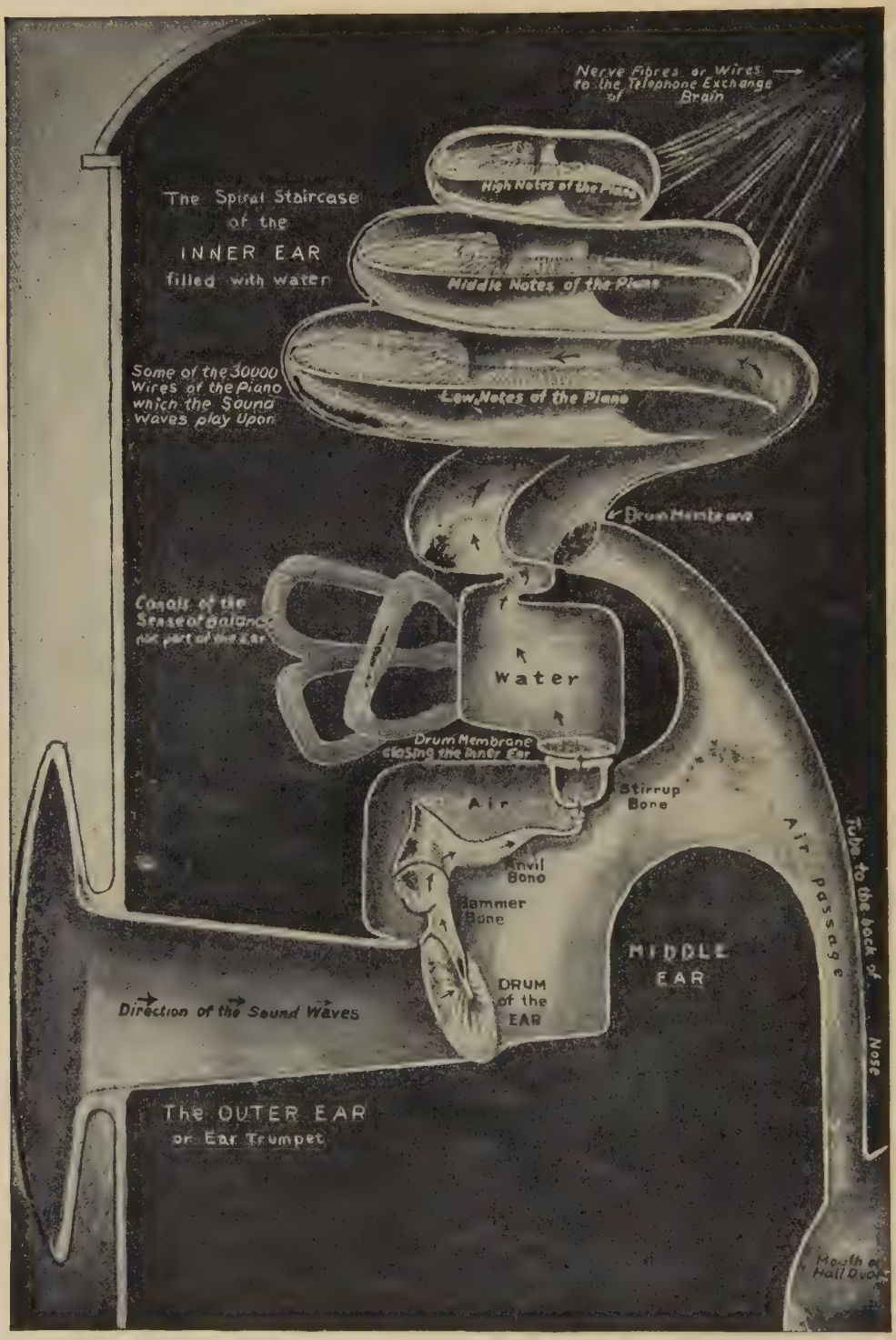
(2) The middle ear or drum, the continuation of the ear passage internal to the drum membrane, and

(3) The internal ear containing the labyrinth and the nerve of hearing.

DESCRIPTION OF THE EXTERNAL EAR

The outermost part, the skin-covered *auricle*, contains no bone, being simply a mass of cartilage covered by skin. It

THE JOURNEY OF SOUND WAVES TO THE BRAIN



This diagram shows the marvelous structure of the ear, and how sound reaches the brain. There is marked similarity between the ear and a telephone receiver by which we are able to receive messages from the outside world. Hearing is simply the result of sound-waves striking the drum of the ear which set in vibration the bones of the middle ear, and they in turn vibrate the drum of the inner ear. This sets in motion a fluid, and the wave motions are conveyed along the spiral staircase to the wires, or nerves of hearing, and from there to the telephone exchange, or brain.

acts as a sound catcher and improves the hearing by directing sound-waves into the opening or external *meatus.* This meatus or passage-way runs directly inward for an inch and a half. The inner half of the passage-way runs through solid bone, ending abruptly at the membrane or sounding-board of the ear.

DESCRIPTION OF THE MIDDLE EAR

This part begins at the inner surface of the membrane, and extends inward for about a quarter of an inch. The outer surface of the membrane can be seen by the observer on pulling the top of the auricle or fleshy part of the ear a little upward, so as to straighten out the somewhat curved passageway or meatus. The membrane which is placed transversely across the meatus is whitish-pink or yellowish color.

WHAT THE MIDDLE EAR CONTAINS

The chief contents of the cavity of the middle ear are three tiny bones called the *malleus* or hammer bone, the *incus* or anvil bone, and the *stapes* or stirrup bone. In addition, an important nerve called the *chorda tympani* passes across the middle ear chamber. The three little bones contained in the middle ear may be looked upon as the connecting link between the outer ear, which gathers the sounds, and the internal ear, which transmits the effect of the sound waves to the brain, where they are translated into what we call hearing.

From without inward the three little bones lie touching each other, end to end, the outer end of the first bone being implanted between the layers of the drum membrane and the inner end of the innermost bone, fitting into a tiny opening which connects the middle ear with the internal ear. As the result of their lying touching each other, any movement of the ear drum caused by a sound wave striking against its outer aspect, moves the malleus bone; this, in turn, moves the middle incus, and this passes the movement on to the innermost part of the stirrup. This, in turn, passes the movement onward to the fluid or *perilymph* in the outermost part of the internal ear, and here the endings of the nerve of hearing receive the stimuli which we recognize as "sounds." (See Plates.)

THE TWO IMPORTANT TUBES OF THE MIDDLE EAR

In addition to these contents of the middle ear there are also two tiny openings which, very necessary for health, are nevertheless sometimes a pathway by which serious disease may attack the ear and destroy the hearing. The first is a small passage-way leading from the upper part of the middle ear cavity through the bone to the *mastoid antrum,* a hollow space in the prominent mass of bone to be felt immediately behind the ear projecting outward and downward from the skull.

The second passage-way opening into the middle ear cavity is that of the Eustachian tube which leads directly to the back of the throat. The importance of this tube is that through it air can find its way directly into the middle ear, so that the air pressure on the two sides of the drum is always kept the same. If it were not for some such arrangement the pressure on the outer side of the drum would become greater than that on its inner surface. This would, of course, push the drum inward, and greatly reduce its mobility.

EXPLANATION OF THE INTERNAL EAR

This is a complicated structure of bony passages curled on themselves, roughly as in a snail shell, and lined with a delicate membrane. This membrane is, so to speak, floating in fluid. The layer of fluid between it and the bone is called the *perilymph,* while the two layers of the membrane enclose a similar fluid termed the *endolymph.* The internal ear or membranous labyrinth may be divided roughly into three chief parts: (1) the cochlea, the true organ of hearing; (2) the semi-circular canals, which control the act of balancing; and (3) the vestibule, or introductory chamber to the semi-circular canals.

The cochlea is a collection of three tubes curled up on themselves in snail-shell fashion.

The central canal of these three is the connecting link by which the sound waves, passed along over the three tiny bones—the malleus, incus, and stapes—finally reach the endings of the main nerve of hearing, the auditory nerve. (See Plate.)

THE EYE AND ITS WONDERFUL STRUCTURE

The human eye is a hollow globe containing fluids and the crystalline lens. Surrounded by its muscles it lies embedded in a cushion of fat in a conical bony hollow called the orbit. Through an opening in the bones making up the back of the orbit, the optic nerve leads from the back of the eye to the brain.

THE EYELIDS AND EYE-LASHES

The eyelids are made of layers of muscle and cartilage with an outer surface of skin and an inner surface which is a continuation of the conjunctiva that covers the eyeball. In the edge of the eyelid a series of tiny glands are embedded. The mouths of these open on the margin of the lids. The eye-lashes, whose duty it is to act as a screen, preventing foreign bodies such as dust or other air-born objects getting into the eye, are also inserted in the edge of the lid.

WHAT MAKES THE TEARS FLOW

About one-eighth of an inch from the internal angle of the eye, a small projection is to be seen on the margin of the lid. In the center of this is a tiny opening through which the tears as they collect in the eye are led away through two small canals to the lachrymal sac in the upper part of the nose. The lachrymal gland, which secretes the tears, or water, of the eye, is situated above on the outer side of the eyeball, between it and the bones of the orbit. The lachrymal gland is constantly secreting tears, which are carried by narrow ducts to the upper surface of the eyeball, whence they flow down over the eye, finally being collected at the inner corner of the eye and passing into the nose through the lachrymal punctures described above. Under certain circumstances, as from emotion, a blow, or the irritation of a cold wind, the tear fluid is secreted faster than it can escape through the punctures, and so flows over the lids and down the cheeks.

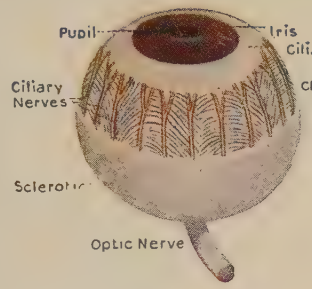
HOW THE EYE IS HELD IN PLACE

The eye is held in its socket or orbit by (1) the optic nerve, (2) by its six muscles attached to various points of its circumference, (3) by the conjunctiva, which is reflected off from its attachments to the outer coat of the eye directly on to the lids, and (4) by the eyelids themselves.

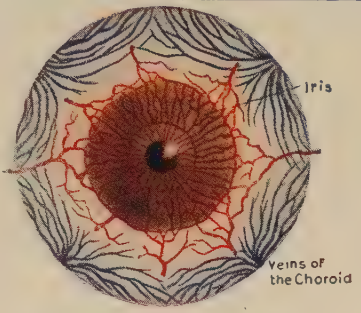
HOW THE EYE IS CONSTRUCTED

The *cornea* is the transparent, bulging, central portion of the eye covering the pupil and the colored iris. Made of tiny transparent cells closely packed together, the cornea is not nourished by blood carried to it by the blood-vessels but by lymph which permeates through it in the tiny channels between the cells. By its curved surface it plays a part in focusing rays of light on to the lens situated just behind the iris.

PICTURE DIAGRAMS SHOWING THE DELICATE STRUCTURE OF THE EYE AND EAR



THE NERVES OF THE EYEBALL



BLOOD VESSELS OF THE EYEBALL

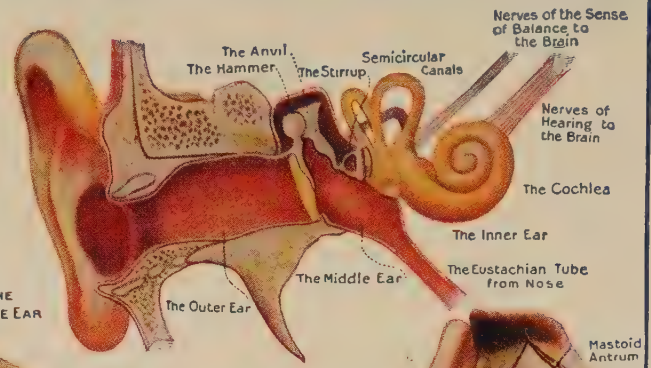


DIAGRAM OF THE CHAMBERS OF THE EAR

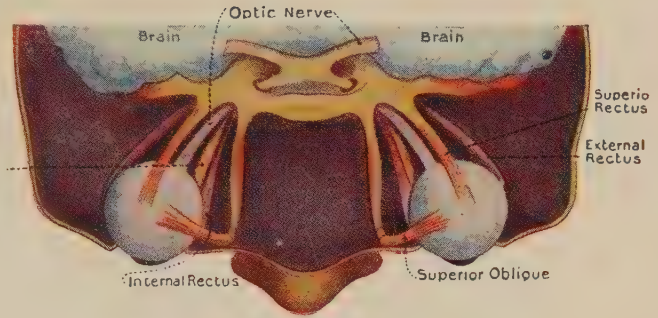
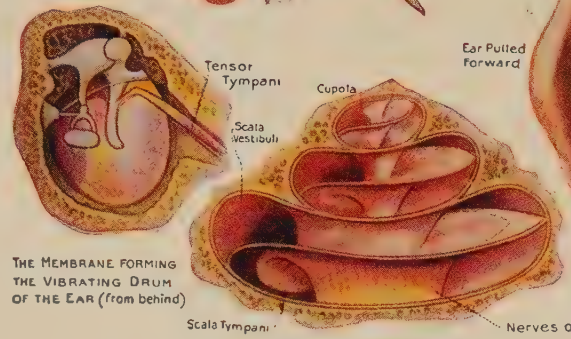


DIAGRAM SHOWING MUSCLES CONTROLLING THE EYES



THE MEMBRANE FORMING THE VIBRATING DRUM OF THE EAR (from behind)

THE COCHLEA LAID OPEN

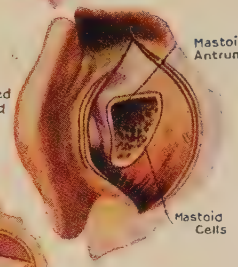
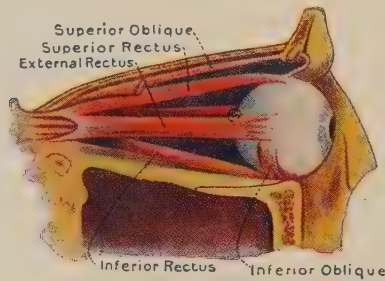
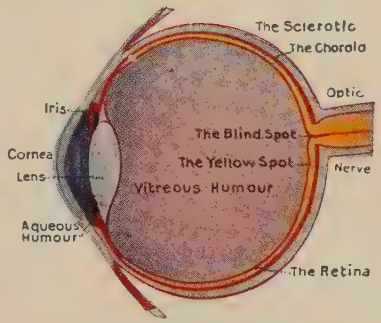


DIAGRAM SHOWING POSITION OF THE MASTOID PROCESS BEHIND EAR



MUSCLES OF THE RIGHT ORBIT



SECTION OF THE EYEBALL

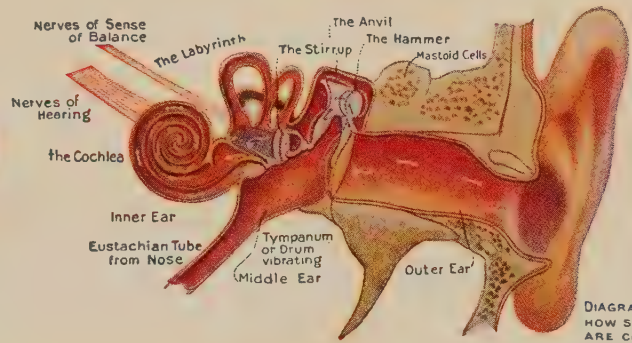


DIAGRAM SHOWING HOW SOUND WAVES ARE CONVEYED TO THE BRAIN.

Directly behind the cornea come the *iris* and *pupil*. The latter is nothing more than a hole in the center of the iris through which light enters the eye.

How the Light is Regulated

The iris is the screen of the eye. Just as the photographer uses a screen with a large opening when he wants more light to enter his camera and a small opening when he requires less, so Nature arranges that the iris automatically contracts or dilates to make a larger or smaller pupil opening, according to the amount of light needed within the eye for purposes of vision. When the light is very bright less is needed in the eye. Thus in brilliant artificial light at night one's pupil is small. On the other hand, when the light is waning, as in the dusk or semi-darkness, the pupil is enlarged by the iris contracting down to a narrow ring under the outer circumference of the cornea.

What Determines the Color of the Eye

The color of the eye depends on the position and amount of pigment cells in the iris. In the dark brown eye there is an abundance of pigment scattered through the substance of the iris as well as in the front layers nearest the surface. In the blue eye the pigment cells are buried deep in the iris and are fairly plentiful in amount. The colorless eye of the albino is the result of a deficiency of pigment in the iris.

The iris is fixed at its outer circumference, but its inner rim, which makes the border line of the pupil, is free, so that when the iris contracts the pupil becomes larger, since its inner free margin is drawn outwards toward the fixed outer margin. Close up against the deeper surface of the iris comes the crystalline lens.

Why and How We See

The lens is a compact body of transparent cells, bi-convex in form, and closely similar to the glass lens of a camera. The lens of the eye, however, differs from the camera's glass lens because it changes its shape in focusing for objects at different distances. This focusing, which takes place automatically, is known as "accommodation."

The object of the change in the shape of the lens is that no matter at what angle the rays of light reflected from the object looked at fall on the outer surface of the lens (through the opening in the iris), they may be accurately focused on the surface of the retina, or lining membrane at the back of the eye. When looking at a distant object the lens is fairly flat, because when in this position the rays of light will be accurately focused on the retina. If the eye is now turned to an object near at hand the rays of light from the object are more divergent than in the previous case, and if the lens retained its previous shape they would fail to be focused accurately on the surface of the retina. Hence Nature has arranged that the lens of the eye is elastic, automatically becoming flatter by the action of the ciliary muscle when distant objects are looked at and rounder or deeper when nearer objects are looked at.

Effect of Age Upon the Lens

Up till middle age the eye retains in full this power of automatic accommodation. From middle age onward, however, the lens becomes less and less elastic. As a result the lens constantly remains more or less flattened. Although vision for objects at some distant from the eyes remains perfect, oldish people very frequently have to wear glasses (to correct the too great flatness of the natural lens) to obtain clear vision of objects close at hand.

What Holds and Surrounds the Lens

The lens is slung in a ligament that is a part of the "ciliary body," which is a continuation of the choroid coat of the eyeball. This ciliary body is a ring of tissue lying behind the iris connected with the anterior portion of the choroid coat of the eye.

Between the iris and the underlying lens on the one hand and the inner surface of the bulging cornea on the other is a small space or cavity filled with a clear transparent fluid called the *aqueous humor*.

The Coats of the Eye

Looking at the white of the eye, the first coat is the transparent conjunctiva,

which is reflected back on to the eyeball from the eyelids. Next comes the sclerotic coat, formed of dense whitish tissue, which seen through the transparent conjunctiva makes up the "white of the eye." The sclerotic coat covers the whole globe of the eyeball with the exception of the transparent bulging cornea in front (which, however, is practically a continuation of the sclerotic), and the back of the eye where the optic nerve enters. The sclerotic is the thickest and densest coat of the eye.

Within the sclerotic coat, and so to speak lining it, comes the choroid coat. Countless blood vessels run through this coat, supplying both the one above it and that beneath it. As this coat approaches the front of the eye under the circumference of the cornea, it thickens into the ciliary body, forming a dense ring of tissues underneath the junction of the cornea and the sclerotic coat.

THE WORK OF THE RETINA

The innermost coat of the eye is called the retina. This coat contains the nerve endings of the optic nerve which, coming through the opening in the bony orbit, passes through the sclerotic and choroid coats. After entering the eye, the optic nerve divides into myriads of fibers, which, spreading from the point of entrance at the back of the eye, form a fibrous network all over its inner surface. In addition to this network of nerve fibers and highly specialized nerve cells, tiny blood vessels entering with the optic nerve branch out on all sides over the retina.

THE RODS AND CONES

The retina is a comparatively thick membrane composed of eight layers of different kinds of nervous tissue. The essential layer, that of the "rods and cones," is the seventh from within outward. Thus a ray of light on entering the eye must pass through six superficial layers before it reaches the "rods and cones."

The "rods and cones" are lying on a layer of colored or pigment cells whose duty it is to prevent diffusion of light within the eye. The eyeball, therefore, is to all intents a camera obscura, the iris representing the shutter, the crystalline lens the camera lens, and the layer of "rods and cones" the sensitive plate. When a ray of light falls on the layer of the "rods and cones," this layer receives a nervous stimulus which is conveyed by the optic nerve to the brain. *It is these sensations which the brain translates into what we term sight.*

Where the optic nerve enters the back of the eye, there are no "rods and cones," hence rays of light falling on this portion of the retina send no stimulus to the brain; in other words, images falling on the "blind spot" are not visible.

The "yellow spot" is a small area at the center at the back of the eye where the retina is very thin, consisting of little more than a single layer of "cones." Images which fall upon this region are seen with the greatest distinctness.

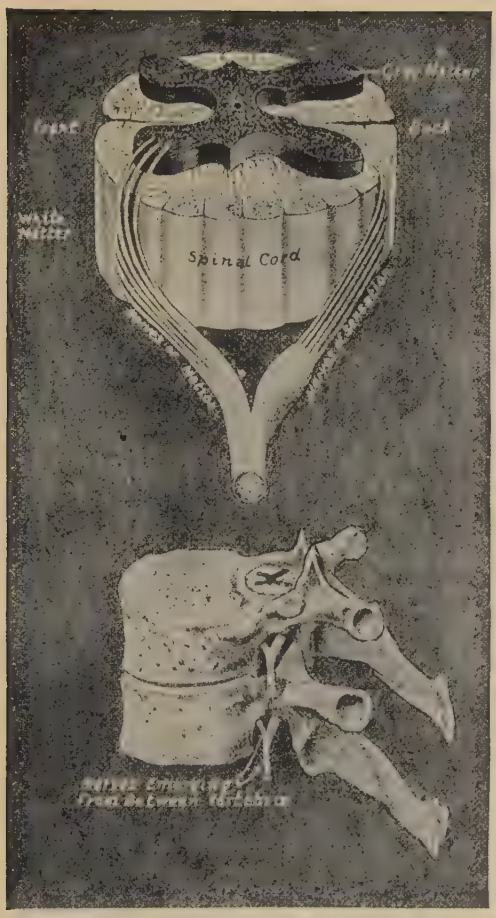
HOW THE SENSE OF SIGHT IS PRODUCED

Sight is a nervous sensation due to the translation by the brain of the effects caused by rays of light being reflected from some object in front of the eye on to the innermost layer of the eye, the retina.

When an object is looked at, rays of light which reach the object from some source of light (such as the sun, a lamp, etc.) fall on the transparent outer part of the eye, the cornea. On account of its curved surface these rays of light are more or less bent inward so as to fall more or less perpendicularly on the forward anterior convex surface of the lens. If the light is weak or dim, the iris, which lies in front of the lens, will automatically contract down so as to make the opening by which the rays can enter the posterior chamber of the eye (the part behind the lens) as large as possible.

If the light is very bright the muscle fibers in the iris will relax so that the iris itself gets larger, and its central opening smaller, so that too much light may not enter. Passing through the lens the rays are focused by the lens so that they are brought together to a point exactly on the surface of the retina.

Here their presence has a certain effect on the rod and cone layer of the retina, the result of which is conducted along the optic nerve to the brain, where it is transformed into what we know as sight.

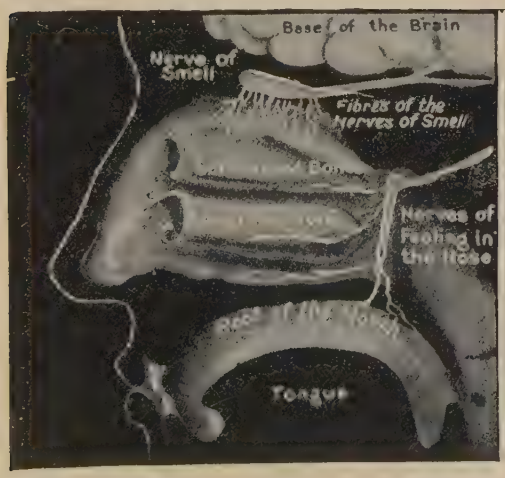


HOW THE NERVES RUN INTO THE SPINAL CORD ON THE WAY TO THE BRAIN

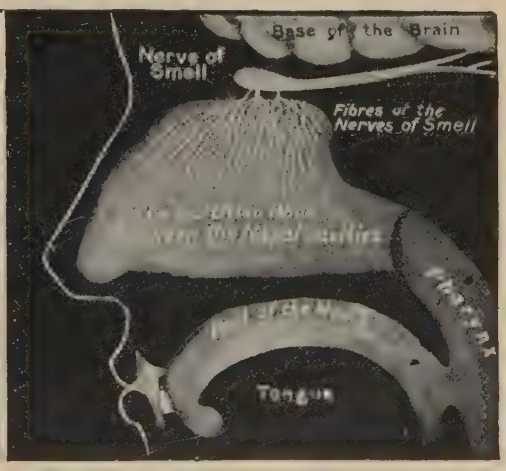
The lower drawing shows how the spinal cord rests in the backbone, and how the nerves pass in and out, those of sensation passing into the spinal cord, as shown in the magnified section above.

THE AREAS OF THE TONGUE IN WHICH THE CELLS OF TASTE ARE DISTRIBUTED

The tongue is covered with various types of taste-bulbs, most of the distinct types that appreciate the sweet, the acid, and the bitter being found in the areas marked on the diagram.



THE OUTER SIDE OF THE NOSE, SHOWING THE NERVES OF SMELL AND FEELING



THE INNER PART OF THE NOSE, SHOWING THE FIBRES FROM THE OLFACTORY BULB

THE NOSE: ORGAN OF SMELL

The nose is composed partly of bone and partly of cartilage, the cartilages being firmly attached to the bones and to one another by fibrous tissue.

The bridge consists of the two nasal bones which are projections of the frontal bone of the forehead. From these are continued the nasal cartilages which form one-half to two-thirds of the external nose.

The interior is a large and complicated chamber divided into the right and left nares, or nostrils, by the partition called the *septum*. This, like the external part, consists of cartilage in front, attached to bone at the back.

The Nostrils, opening on the face in front, run backward for about two inches and open into the pharynx behind. But the single canal is divided into three separate passages some distance inward. This division is effected by the turbinated bones which jut out into the nostril and thus form the upper, middle, and lower air-channels. In this way the warm surface with which cold inhaled air comes in contact is greatly enlarged.

From the mouth cavity the nose is separated by the hard palate. On the external nose, scattered near the tip, are numerous hairs, sebaceous glands, and sweat glands. These glands are very liable to get blocked, giving rise to inflamed spots, and when hairs are pulled out small abscesses are apt to form.

Membrane.—The whole of the interior surface is lined with mucous membrane, and as this has a large area, and is very well supplied with blood, it raises the temperature of inspired air. The mucous membrane of the nose is continuous with that of the pharynx. Any inflammation, such as that which constitutes a "cold in the head," is therefore extremely liable to extend backward and finally reach the bronchial tubes and lungs.

Over this membrane spread a multitude of small threads or nerves resembling the twigs of a branch; there are many such branches within the nostril, and they join together so as to form larger branches, which may be compared to the boughs of a tree. These finally terminate in a number of stems, or trunks, several for each nostril, which pass upward through apertures provided for them in the roof of the arched cavity, and terminate in the brain.

We have thus, as it were, a leafless nerve-tree whose roots are in the brain, and whose boughs, branches, and twigs spread over the lining membrane of the nostril. This nerve is termed the *Olfactory*.

When we wish to smell anything—for example, a flower—we close our lips and draw in our breath, and the air which is thus made to enter the nose carries with it the odorous matter, and brings it in contact with the ramifications of the nerve of smell. Every inspiration of air, whether the mouth is closed or not, causes any odorous substance present in that air to touch the expanded filaments of the nerve.

In virtue of this contact or touching of the nerve and the volatile scent, the mind becomes conscious of odor, though how it does so we know as little as how the mind sees or hears; we are quite certain, however, that if the olfactory nerve be destroyed, the sense of smell is lost.

Besides its endowment by the olfactory nerve, or nerve proper of smell, the nostril, especially at its lower part, is covered by branches of another nerve (known to anatomists as the fifth), of the same nature as those which are found endowing every part of the body with the susceptibility of heat, cold, smoothness, roughness, pleasure, and pain. It is on this nerve that pungent vapors, such as those of smelling-salts, strong vinegar, mustard, and the like, make the sharp impression with which all are familiar.

Can the Sense of Smell be Educated?—The extent to which the sense of smell may be educated far exceeds what most imagine can be realized from this sense. There are probably as many odors as there are colors or sounds; and the compass of one nostril in reference to the first, likely differs as widely from that of another, as the compass of the eye or the ear does in reference to the last two. The wine merchant, the distiller of perfumes, the manufacturer of drugs, the grower of scented plants, the epicure in things savory, the tobacco dealer, and many others, have by long training educated themselves to distinguish differences of odor which escape an uneducated and unpracticed nostril, however acute by natural endowment.

Perfumes.—Much importance attaches to the use of perfumes by both ancient and modern civilized nations. But all the ancient nations who had attained to civilization, were addicted to the use of perfumes to an extent to which no modern people at the present day affords any parallel. Not merely as contributing to the luxury of the body were perfumes so prized. They were used at every sacred ceremonial; lavishly expended at the public religious services; and largely employed at the solemn rites which were celebrated at the burial of the dead.

THE TONGUE: THE ORGAN OF TASTE

The organ of taste is generally held to be synonymous with the tongue, but, in reality, the throat and the nostril are as much concerned as the tongue in the perception of taste. The power of these portions of the body to distinguish savors mainly depends, as in the case of the eye and the ear, upon their connection with the brain through those fine white nerves which have been already referred to. The tongue and the auxiliary organs of taste are largely supplied with nerves, and through them those sensations are experienced which we connect with the words taste, savor, sapidity; sweet, salt, sour, bitter, and the like.

Membrane of the Tongue.—At certain points the membrane of the tongue forms distinct folds, containing fibrous or muscular tissue, which act to a certain extent as ligaments to the tongue. The most considerable of these folds is termed the *frænum* (or bridle) of the tongue, and connects its anterior free extremity with the lower jaw. Other folds of mucous membrane pass from the base of the tongue to the epiglottis; while from the sides of the base, passing to the soft palate, are seen two folds on either side, the "pillars of the fauces."

The upper surface of the tongue is divided into two parts by a long furrow, commencing at the tip, and extending back about two-thirds of the tongue's length.

Muscles of the Tongue.—The muscles of the tongue are usually divided into two groups—*viz.:* the *extrinsic* muscles, which attach the tongue to certain fixed points external to it, and move it on them; and the *intrinsic* muscles, which pass from one part of the tongue to another, constitute its chief bulk, and move it on itself. These intrinsic muscular fibers run vertically, transversely, and longitudinally, and are so interlaced as mutually to support one another, and to act with the greatest advantage.

The Bulbs of Taste.—The mucous membrane is invested by stratified cells, which, over the surface of the tongue, cover little vascular projections termed papillæ. At the back of the tongue are some eight or ten papillæ of quite a different nature, called "circumvallate." They are arranged to form a V with its angle pointing backward. In the epithelium lining the trenches between the papillæ, curious little bodies called taste-bulbs are lodged. Each taste-bulb looks like a flask-shaped barrel or box, the walls of which are composed of flat elongated cells fitted side by side like the staves of a cask. The taste-bulbs open each by a little pore into the trench, and into the deeper part a nerve enters. The impressions are carried by the nerve directly to the brain in either the fifth or the ninth cranial nerves.

Before the substance can stimulate the terminals it is necessary for its aromatic principles to be in solution. This is generally effected through the agency of the saliva.

Four distinct gustatory qualities are appreciated by the sense of taste—sweetness, bitterness, acidity, and salinity. The intensity of the sensation of taste varies with (1) the area of the surface stimulated, (2) the concentration of the stimulant, (3) the length of the period of application, and (4) the temperature of the substance tasted. Tractile impressions, such as harshness, coolness, and astringency, are erroneously attributed to taste.

Mis-Educated and Educated Taste.—Of all the organs of the senses, that of taste is probably the one which receives the worst usage at our hands. The eye, the ear, and the nose are not educated at all, or their education is left to chance, but the tongue is deliberately mis-educated, perverted, and led astray. We eat what we should not eat; drink what we should not drink: eat too much of what we may eat, and drink too much of what we may drink. And the result is, that we ruin our health, enfeeble our bodies, dull our intellects, brutalize our feelings, and harden our hearts.

Yet assuredly taste has its legitimate domain, and it is as unworthy of man's true dignity that he should be content to live upon the husks that the swine do eat, as that he should be miserable if he do not fare sumptuously every day. All the other senses have a direct interest in the practical decisions of the sense of taste. Drunkenness and dyspepsia dim the eye, dull the ear, blunt the nostril, and make the hand tremble.

A Victim to the Other Senses.—The sense of taste, in truth, is at the mercy of the other senses; and though it can revenge itself for their neglect or misuse of it, it is a sufferer by its own revenge.

Helpless, selfish, and exacting, the dependent of the other senses, and the servant of the body rather than of the soul, it frequently links us more with the lower animals than with higher existences, and has no element of ethereality about it.

A feast, indeed, may furnish pleasure to every sense, but it is usually not till hunger is appeased that the higher senses are ministered to. But the tongue, as the organ of taste, is the commissary-general, without whose supplies the other senses can achieve no conquests, and it is entitled to its share in the honors assigned to the united five; but its own sword is seldom drawn, and its aspect is not heroic.

THE HAND: CHIEF ORGAN OF TOUCH

The last of the bodily senses is *Touch.* It has the widest gateway, and largest apparatus of them all; for though we are in the habit of speaking of it as localized in the fingers, it reigns throughout the body, and is the token of life in every part. The nearest approach to death which can occur in a living body, is the condition of paralysis or palsy, a death in life, marked in one of its forms by the loss of that sense of touch which is so marked an endowment of every active, healthy creature.

The tactile susceptibilities of the skin depend, as do the peculiar endowment of the other organs of the senses, on its plentiful supply with those wondrous living nerves, which place in vital communication with each other all the organs of the body, on the one hand; and that mysterious living center, the brain (and its adjuncts), on the other.

Our simplest conception of an organ of sense is supplied by the finger, which whether it touches or is touched, equally realizes that contact has been made with it, and enables the mind to draw conclusions regarding the qualities of the bodies which impress it. Now, after all, every one of the organs of the senses is but a clothed living nerve conscious of touch, and they differ from each other only in reference to the kind of touch which they can exercise or feel. Keeping in view that to touch and to be touched is in reality the same thing, so far as the impression of a foreign body is concerned, we can justly affirm that the tongue is but a kind of finger, which touches and is touched by savors; that the nostril is touched by odors; the ear by sounds; and the eye by light.

The *Hand* is emphatically the organ of touch, not merely because the tips of the fingers, besides being richly endowed with those nerves which confer sensitiveness upon the skin of the whole body, possess in addition an unusual supply of certain minute auxiliary bodies, called "tactile corpuscles," but because the arrangement of the thumb and fingers, and the motions of the wrist, elbow, and arm, give the hand a power of accommodating itself spontaneously to surfaces, which no other part of the body possesses. Moreover, when we speak of the hand as the organ of touch, we do not refer merely to the sensitiveness of the skin of the fingers, but also to that consciousness of pressure upon them in different directions, by means of which we largely judge of form.

When a blind man, for example, plays a musical instrument he is guided in placing his

fingers, not merely by the impression made upon the skin of them, but also by impressions conveyed through the skin to these little bundles of flesh called muscles, which move the fingers.

In many respects the organ of touch, as embodied in the hand, is the most wonderful of the senses. The organs of the other senses are passive, the organ of touch alone is active. The eye, the ear, and the nostril stand simply open: light, sound, and fragrance enter, and we are compelled to see, to hear and to smell; but the hand selects what it shall touch, and touches what it pleases. It puts away from it the things which it hates, and beckons toward it the things which it desires; unlike the eye, which must often gaze transfixed at horrible sights from which it cannot turn; and the ear, which cannot escape from the torture of discordant sounds; and the nostril, which cannot protect itself from hateful odors.

Moreover, the hand cares not only for its own wants, but, when the other organs of the senses are rendered useless, takes their duties upon it. The hand of the blind man goes with him as an eye through the streets, and safely threads for him all the devious ways; it looks for him at the faces of his friends, and tells him whose kindly features are gazing on him; it peruses books for him, and quickens the long hours by its silent readings.

It ministers as willingly to the deaf; and when the tongue is dumb and the ear stopped, its fingers speak eloquently to the eye, and enable it to discharge the unwonted office of a listener.

The organs of all the other senses, also, even in their greatest perfection, are beholden to the hand for the enhancement and the exaltation of their powers.

It constructs for the eye a copy of itself, and thus gives it a telescope with which to range among the stars; and by another copy on a slightly different plan, furnishes it with a microscope, and introduces it into a new world of wonders.

It constructs for the ear the instruments by which it is educated, and sounds them in its hearing till its powers are trained to the full.

It plucks for the nostril the flower which it longs to smell, and distills for it the fragrance which it covets.

As for the tongue, if it had not the hand to serve it, it might abdicate its throne as the "Lord of Taste." In short, the organ of touch is the minister of its sister senses, and, without any play of words, is the handmaid of them all.

And if the hand thus munificently serves the body, not less amply does it give expression to the genius and the wit, the courage and the affection, the will and the power of man. Put a sword into it, and it will fight for him; put a plow into it, and it will till for him; put a harp into it, and it will play for him; put a pencil into it, and it will paint for him; put a pen into it, and it will speak for him, plead for him, pray for him.

What will it not do? What has it not done? A steam engine is but a larger hand, made to extend its powers by the little hand of man! An electric telegraph is but a long pen for that little hand to write with! All our huge cannon and other weapons of war, with which we so effectually slay our brethern, are only Cain's hand made bigger, and stronger, and bloodier!

What, moreover, is a ship, a railway, a lighthouse, or a palace—what, indeed, is a whole city, a whole continent of cities, all the cities of the globe, nay, the very globe itself, in so far as man has changed it, but the work of that giant hand, with which the human race, acting as one mighty man, has executed its will!

What an instrument for good it is! What an instrument for evil! and all the day long it never is idle. There is no implement which it cannot wield, and it should never in working hours be without one. It is the one universal craftsman. For the queen's hand there is the scepter, and for the soldier's hand the sword; for the carpenter's hand the saw, and for the smith's hand the hammer; for the farmer's hand the plow; for the miner's hand the pick; for the sailor's hand the oar; for the painter's hand the brush; for the sculptor's hand the chisel; for the poet's hand the pen; and for the woman's hand the needle.

For each willing man and woman there is a tool they may learn to handle; for all there is the command, "Whatsoever thy hand findeth to do, do it with all thy might."

Such are the five entrance-ways of knowledge, which John Bunyan quaintly styles Eye-gate, Ear-gate, Nose-gate, Mouth-gate, and Feel-gate.

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THE CHILD WORLD

THE GROWING BODY—WORK AND STUDY—FOOD—THE NERVOUS SYSTEM—PUBERITY —REST AND SLEEP—THE EYE—THE EAR—OTHER SENSES

THE HEALTH OF CHILDREN DURING SCHOOL LIFE

Children begin school life at an age which is, unfortunately, one of the greatest importance in their physical development. It is a truism that no mechanism, whether animate or inanimate, can do two things at once and get as good results as when all its efforts are being directed toward one object. So it is obvious that any vital energy used in developing a young child's brain must be taken away from the amount that had hitherto been entirely devoted to physical growth. Too often this fact is lost sight of both by energetic teachers and ambitious parents.

Instead of being delighted with the rapid development of the child's mind, parents should receive any evidences of abnormal advancement with some suspicion of its true worth.

WHEN THE CHILD FIRST GOES TO SCHOOL

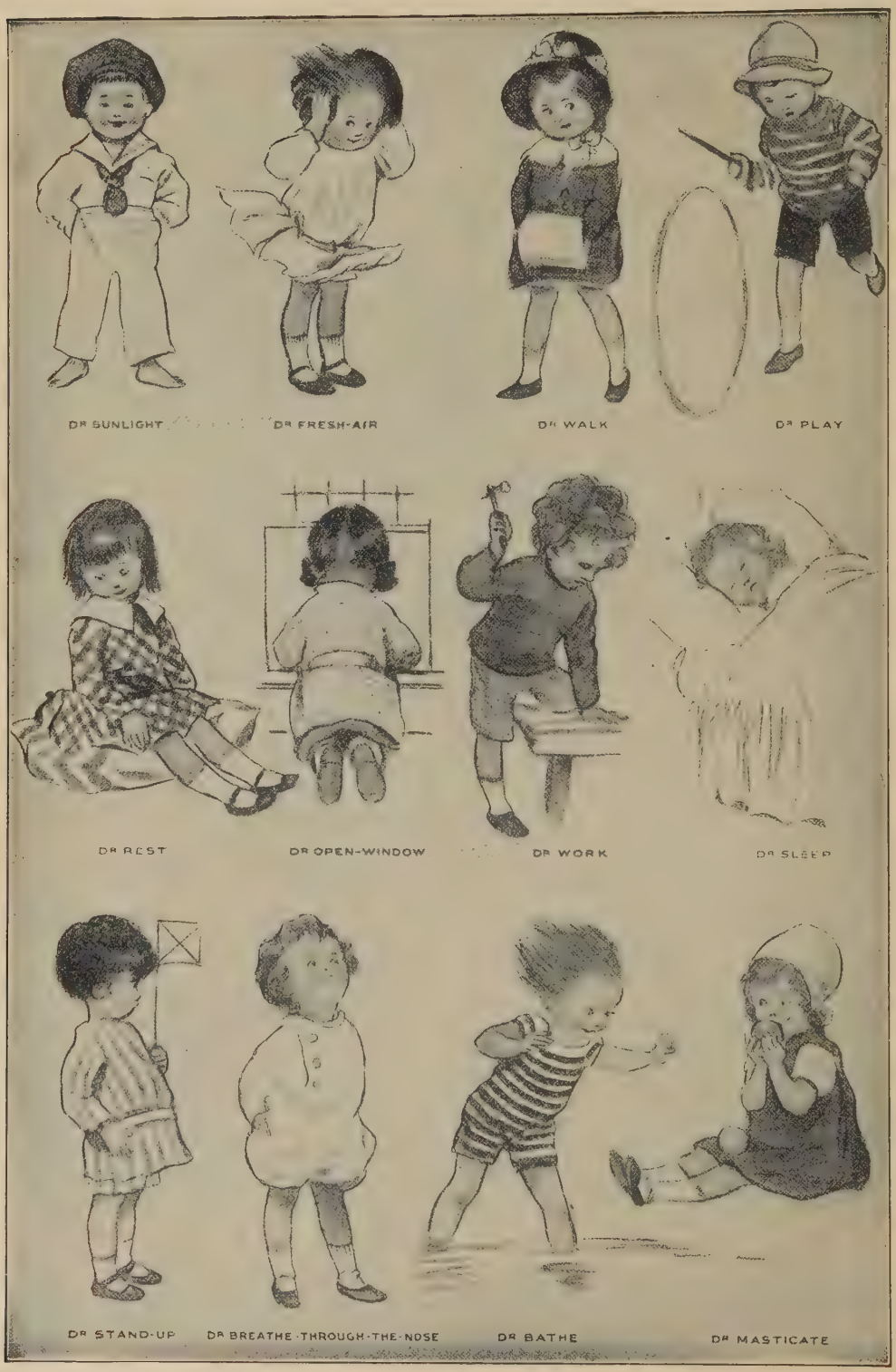
At the age of six, when the average child first goes to school, practically everything he sees is new and interesting, and worthy of deep consideration. His brain gets no rest from the time he wakes until he goes to sleep at night.

To do its work, the brain needs a full and active blood supply, and this it will take often at the expense of leaving an inadequate amount for the demands of the rest of the body.

Curiously enough, excessive mental activity seems to have no stunting effect on the growth in the way of height. It is in breadth and thickness that the body suffers. Everyone is familiar with the tall, lanky boy or girl in the early teens who is said not to care much for games and exercise, and is, unfortunately, "rather delicate." This youngster is almost certain to be pointed out by the proud parents as being extremely well up in his studies.

Short of encouraging laziness or indolence at school, it really makes very little difference to the ordinary man or woman, so far as their adult mental attainments go, whether they were ranked as fairly good scholars or fairly poor ones when they were young children. On the other hand, the effort necessary to be made by a sensitive, not over-

WHAT NATURE'S DOCTORS PRESCRIBE FOR CHILDREN



brilliant child to keep a good place among its fellows may have a serious physical effect that will hamper him or her throughout life.

The effort should be made when a child is first sent to school to determine just how much work he can do comfortably and happily. If an attempt is made to force him to do more than this, he will become depressed and worried. With children, any mental worry will shortly produce unmistakable signs on the physique. It is a bad plan to attempt to get as much as possible out of a child; there should always be a certain amount of vital energy left for emergencies.

IMPORTANT CONDITIONS AFFECTING THE CHILD'S LESSONS

With young children, no lesson should last for more than half an hour, and if possible, a short interval between each lesson should be spent in the open air. If the young scholar is notably in advance with his school work, discourage this; or, at any rate, carefully consider whether his health will allow such active development. If backward and seemingly lazy, the cause of the indolence should be sought first in the physical condition before the character is assailed.

Above all, no child under fifteen should have to do any routine night study to keep up in his lessons. Young eyes are easily strained, and young bodies are easily tired. Watch a tired child who has to study at night; he will get his body in the most comfortable position he can manage, and will take no thought of the direction from which the light falls on his page. Nor has he the energy to hold his book so that the plane of the lines is always parallel to that of his eyes.

His mind may accumulate a little extra book knowledge by such work, but only at the risk of strained eyes and possible spinal defects. Lateral curvature of the spine, in a great majority of cases, may be traced back to habitual faulty postures used by children when at school work. A fair rule to make about night work is to allow a child to study at home only so long as he will comfortably sit upright and hold his book at a correct angle.

In children, the physical state is a very good guide to the mental condition. If the body is tired, the mind is in no fit state to absorb knowledge. The thin, narrow-chested, delicate youth, perhaps with strained eyes and nearly always with a good school record, is nine times out of ten a preventable mistake.

If, when first he showed signs of more than average scholarship, his parents had noted that this superiority was due principally to work done when physically tired, and to neglect of outdoor games and general "play," a little sense of the comparative worth of health and youthful scholarship would have given him a greater chance of developing into a valuable citizen.

THE PROPER TIME FOR WORK

A child's brain, and its body as well, are in the prime of their vigor during the morning hours. From nine till noon, therefore, should be the period of the hardest mental or physical work he undergoes. Evening preparation of lessons is harmful, not only because it tends to bring into a state of high activity the brain, which shortly should be quiet and ready to sink into slumber, but also because it throws hard work on an already fatigued organ. Much of the nervousness, debility, and insomnia so common among school children can be traced to evening preparation.

NECESSITY OF ABUNDANT FOOD

The more actively growing the tissues, the greater the need for abundant nourishment. The growing child, therefore, requires more food in relation to his size and weight than does the grown person who has passed the stage of rapid development.

No fixed rule can be laid down as to how much a child should eat. Generally speaking, the country-bred child, living an outdoor life, may rely on his own appetite as a guide. On the other hand, the city child, living a more indoor artificial life, may have little appetite, and as a result, if not watched, may lapse into a condition of malnutrition simply through underfeeding. The best guide, perhaps, is the child's weight. If he is continually below weight, this fact may in all cases be taken as proof either that the child's food is unsuitable to its age and digestive powers, or else deficient in amount.

EFFECT OF THE SEASONS ON THE NERVOUS SYSTEM

The effect of the change in seasons is much more marked in children than in grown people. In the Spring in particular the watchful mother should keep a careful eye on the health of her little ones. "There come with the Spring in many children," writes a noted physician, "a restlessness and excitability, a perversity and irascibility of temper, or a listlessness, and indisposition for exertion that are not displayed at other times; and there come then, also, more plentifully than at other seasons, physical indications of debility and the scrofulous habit, such as enlarged glands and tonsils, dyspepsia and loss of appetite, strumous ophthalmia, discharges from the ear, and enlargements of joints."

The moral is that since the body is growing fastest (and therefore has the greatest need of husbanding its vitality) in the Spring time, any extra pressure on the nervous system as from prolonged school hours, or any undue exertion, should be strenuously avoided. Unfortunately with the "final" examinations in the early summer, our school systems demand that the hardest and most strenuous work of preparation falls in the Spring time, the season at which the body is least fitted to withstand abnormal stress.

When a child or growing boy or girl becomes more nervous in the Spring time than is his usual habit, or becomes depressed in mind, or constantly complains of being tired, the only common-sense treatment is to put an end at once to all schooling for the time being, and to turn the child out-of-doors every day for all the hours of sunlight.

THE PERIOD OF PUBERTY AND ITS SPECIAL PROBLEMS

Parents should ever be watchful regarding the education of their young children when they approach the age of puberty, that is, the period when the child begins to develop into the man or woman.

Profound and rapid changes take place at this period in mind, brain, the nervous system, the glandular system, and, one may indeed say, in the body generally. The nerve centers temporarily lose some of their normal stability, and such conditions as insanity, hysteria, and epilepsy, rare in childhood, now become common. Even though no actual nervous disease develop, there is quite commonly during this change from childhood to adult life a period of nervous excitability and exhaustion accompanied by physical weakness, which to a great extent unfits the young person for close pursuit of his or her studies. Particularly in young girls is there the greatest necessity for curtailing any tendency to overwork at school during this period.

CONDITIONS OF BONES AND MUSCLES AT THE PERIOD OF PUBERTY

At this time there is also rapid growth and development of the bones which lengthen rapidly, and are still soft and cartilaginous in places. It is all-important at this period, therefore, that the muscles on the two sides of the body receive roughly the same amount of use, otherwise there is grave danger of some deformity, such as lateral curvature of the spine, developing.

While the bones are in this condition of rapid development, all muscle-straining attitudes, such as sitting upright at a desk, practicing at the piano, writing, painting, etc., should be kept within such limits as never to entail real fatigue. Young girls at this period, even more than boys, require all their strength and vitality to support them in their rapid growth. This does not mean, however, that all muscular exercises must be forbidden during the period of puberty, which may be reckoned as from twelve to sixteen in girls, and from thirteen to sixteen in boys. The point is that violent, really fatiguing exercise, such as hockey, hunting, cycling tours, mountain climbing, etc., as well as all occupations which entail the holding of the muscles tense and fixed in one position for a long period, should be indulged in very sparingly, if at all. The young girl can obtain all the exercise necessary for health in less strenuous outdoor pursuits such as golf, croquet, a little not too strenuous tennis, walking, etc.

GENEROUS HOURS OF SLEEP SHOULD BE ALLOWED

While moderate mental work does not in the healthy grown person necessitate an increase in the amount of sleep, the child at school, constantly using his brain in the accumulation of new ideas,

needs an even more generous proportion of sleep than if his brain were not so occupied. Again, if the child shows any signs of nervousness, he ought to be allowed to sleep a little longer than the more stolid non-temperamental child. The following is the average duration of sleep required at different ages:

4 years of age	12 hours
7 years of age	11 hours
9 years of age	10½ hours
14 years of age	10 hours
17 years of age	9 hours

Up to the approach of puberty (the change from childhood to adult life) a child may well be allowed to sleep a little later in the morning in the winter than in summer. Again, if as is frequently the case, he should suddenly commence to grow in height very rapidly an extra hour or half-hour in bed may be of the greatest service in weathering the strain of the rapid growth.

Precautions to Prevent Sleeplessness

Insomnia is sometimes very troublesome in young children, demanding most painstaking treatment. Most important in encouraging the habit of going to sleep immediately on being put to bed is regularity in the hour of bedtime. Unless the child is put into bed at a certain fixed hour with clock-like regularity, the habit of getting sleepy (which is such an important factor in going to sleep) cannot be normally developed.

Sometimes a subdued, shaded light will sooth a nervous child's excited brain and so induce sleep. A child who wakes in terror in a pitchdark room may for years be nervous about going to bed in the dark. Any attempt to stamp out this tendency to nervousness by refusing a comforting glimmer of light in the room may bring on a habit of sleeplessness on first going to bed which may be difficult to eradicate. Sometimes a softly-ticking clock, by affording a sense of companionship, encourages the child to drop off to sleep.

Mental Quietude and Good Ventilation

Another factor in encouraging sleep is a quiet mental state, which is best brought about by the strict avoidance of all exciting games or other mental activities for at least an hour before bedtime. School lessons prepared in the evening are a fertile source of insomnia in children. The brain, keyed up to working at full pitch, cannot quiet down at its owner's wish, and its unwonted activity may banish sleep for an hour or more.

While free ventilation is essential in the child's sleeping-room, it should never be forgotten that the young are more susceptible to cold than are grown people, and have not the same power of generating extra body heat to replace any undue loss of warmth from exposure to outside cold. The temperature of the child's bedroom, therefore, should be kept between 55° and 60° F. If below this, a general feeling of chilliness, and in particular of cold feet, may be the cause of sleeplessness.

Apart from the discomfort and misery caused by the feelings of chilliness, cold feet lead to the adoption of postures in bed which are anything but conducive to health.

Beneficial Effects of the Bath

In nervous children who sleep badly, a hot bath or a hot mustard foot bath often acts like a charm, the child falling into deep sleep almost as soon as it has been tucked in bed. The warmth, by dilating the blood-vessels, on the surface of the body in the case of the full bath, or of the feet in the case of the mustard foot-bath, draws blood away from the brain and so, reducing its activity, allows it to quiet down into sleep.

Where did you come from, baby dear?
Out of the Everywhere into here.
Where did you get those eyes so blue?
Out of the sky as I came through.
What makes the light in them sparkle and spin?
Some of the starry twinkle left in.
Where did you get that little tear?
I found it waiting when I got here.
What makes your forehead so smooth and high?
A soft hand stroked it as I went by.
What makes your cheek like a warm white rose?
I saw something better than anyone knows.
Whence that three-cornered smile of bliss?
Three angels gave me at once a kiss.
Where did you get this pearly ear?
God spoke, and it came out to hear.
Where did you get those arms and hands?
Love made itself into bonds and bands.
Feet, whence did you come, you darling things?
From the same box as the cherubs' wings.
How did they all just come to be you?
God thought about me, and so I grew.
But how did you come to us, you dear?
God thought about you, and so I am here.

(The above poem was written by George MacDonald, Scottish novelist and poet; born 1824, died 1905. He wrote a long list of novels, stories and poems. His children's poems and stories are deservedly popular, and contain numerous passages of singular beauty, lighted up with fine fancy and descriptive power.)

road from babyhood to schooldays, while his mother still holds him by the hand.

The training of your boy's ear in detecting the sounds that g to make up the words he uses is of the very first importance. You encourage him in the use of language by getting him to talk freely about what you do together, describing in his own pretty way the flowers, birds, toys, pictures that he loves. All the time you are gently insisting on perfect pronunciation, clear, pleasant modulation of his speaking voice, quiet breathing through the nose. Presently, when you see he is quite ready for it, you lay stress on the sounds made at the beginning and end of such words as cat, dog, puss, pig. He will soon copy quite accurately the sounds of the various consonants, and find other words beginning or ending with similar sounds to those in the examples you give.

Later will come the vowel sounds, and patient work will be needed to make him see the difference in the various sounds of a, o, and so on. At this stage it will amuse him to have a looking-glass before him to see how the shape of his mouth alters when speaking. Let him practice working the muscles round his lip and moving his tongue freely. It will also help if he sings the vowels, thus—take deep breath, sing *a* (as in father) as long as the breath lasts; take breath, sing *a* (as in fate), in same way; and so on with all the vowel sounds.

You will, of course, make a table of all the sounds you teach him for your own use, with lists of suitable words, and something has really been accomplished in the numberless five-minute sound-lessons when the child can break up the words he uses into the sounds that go to make them—b-u-n, bun; f-i-g, fig.

So much for the first training in recognizing and reproducing the sounds.

And now we come face to face with the much-discussed question—when and how is a child to learn the letters (the printed signs of sounds) and the names given to these letters? Some children settle this question for themselves by "picking up" these letters and their names from picture-books and blocks with little outside help, but they will find it useful later on to know the *names* of the letters and the *order* of the alphabet. See to it that your boy learns to call the letters by their sounds, not their names, and help him to realize that the letters are the *signs of the sounds*, used to tell us what sounds we are to utter.

You have a sand-tray? Let the fat little finger practice making a round *o* in it, while the rosy lips form the long *o*, as in n*o* and lord, the short sound, as in n*o*t; or tracing crooked *s* while he hisses like the geese on the common, or says "puss," "sat," and so on.

If you have a box of good, plain letters, let him pick out the *m* in *m*ouse, the *t* in table and in ra*t*. Your small blackboard will come in handy, for he will be most happy to print on it in chalks the letters as he learns them. Let him model their shapes in clay, draw and paint them in colors, make them out of slips and curves of colored cardboard, varying the practice as much as possible; and see to it that he is never bored. He will soon greatly enjoy identifying and cutting out large and small letters as he learns them from advertisements in big type, and pasting them in a "letter" scrapbook, made by fastening together a few sheets of brown paper. Guide him to class together *v* and *f*, *r* and *l*, *s* and *z*, *b* and *p*, *m* and *n*, *t* and *d*, and the vowels in their order, with a whole page to themselves—this with a view to the time when he begins to study seriously.

But that is looking far ahead. We have now brought him to the point of being ready for his first reading lesson. But do not hurry; give his eyes plenty of distance work, plenty of training in reading Nature's wide-open book, before you put printed books into his hands. He is to be a keen lover of books, so make him want to read, and see to it that he is interested and happy every moment of the time given to his reading lesson.

Here is the method:

Buy three copies of some well-printed simple stories; put one copy aside, and cut up the other two, pasting the sheets on drawing-paper, alternate pages face down, so that you get one complete copy out of the two books.

Now cut up, line by line, and then word by word, the first little story, and put the words in a small tray or box. Perhaps it is, "Thank you, pretty cow." So now print on your blackboard two or

three of the words—*cow*, *milk*, *pretty*, the child earnestly watching and listening while you say the words very distinctly, giving the component sounds as clearly as you possibly can.

Then hand him the tray, and let him pick out the words and name them as you have done. Proceed in the same way with a few more words of the story, printing them as you go in a column on the board, and when he knows them up and down, in and out, the great moment has arrived. Your heart will beat as you put the little book—the copy that was not cut up—into his hands. He can read, so much at any rate, quite readily.

Note that there must be no spelling; it is "look and say." Next day you take word-building with the box of letters, and a fine game you have, based on the words learned the day before. Add letters and syllables in every way you can think of, always giving sounds, not names; let the boy read, copy, take from dictation these new words for a happy twenty minutes. He is now learning to spell, that he may be able to write with the sound signs. Go on like this, reading one day, word-building the next, till several sets of little books have been used up.

Let him dramatize the little stories and poems whenever you can; take parts with him, thus laying the foundation of real, live reading aloud, without any disfiguring mannerisms or self-consciousness. His stock of words grows apace—ten a day will give over three thousand in a year—and little by little, as opportunity offers, the more complex sounds in our language and its puzzling irregularities are unfolded and made familiar. Thus reading, elocution, spelling, writing, all advance together.

The study of Nature should go hand in hand with the study of books. Children love the outdoors—the trees, the flowers, the grass,—all living things. Nature trains the special senses, awakens the powers of observation, and creates a love of both the beautiful and the useful.

THE CHILD'S PICTURE GRAMMAR—NOUNS AND VERBS

A NOUN IS THE NAME OF ANY THING—A VERB TELLS WHAT A NOUN DOES OR IS DONE TO

WHAT OUR DOMESTIC ANIMALS GIVE US

THE USEFUL THINGS OBTAINED FROM THE COW, HORSE SHEEP, GOAT, PIG, FOWL, AND DEER

THE CHILDREN OF THE ANIMALS

The young of some animals have special names, and with many of these we are familiar. But there are other young creatures whose particular names are not so well known. In the pictures on this page we see the young of eighteen different creatures with their mothers, and the special names of these are given.

NATURE AS THE FIRST INVENTOR AND CRAFTSMAN

THE LANTERN FLY OF TROPICAL AMERICA LIGHT WITHOUT HEAT

ONE OF THE FIRST BOXES, A RECEPTACLE FOR BRAZIL NUTS

THE FIRST BALL-AND-SOCKET JOINT—A HUMAN SHOULDER

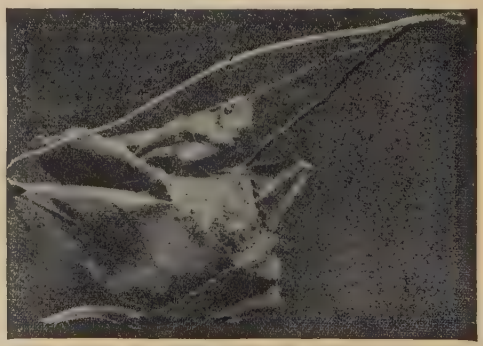
THE FIRST PUMP —A HEART

THE FIRST SPINNERS—A MOTH WHOSE CATERPILLAR SPINS THE COCOON

THE FIRST BALLOON—THE "SWELLFISH," WHICH INFLATES ITSELF

THE FIRST HINGE—THE THORNY OYSTER OF THE PACIFIC

A LOBSTER'S CLAW—THE ORIGINAL OF A GAS FITTER'S PINCERS



THE TAILOR BIRD, WHICH STITCHES THE LEAVES OF HER NEST TOGETHER

STORIES: To Tell and To Read

Stories are the "spice" of childhood. The eager delight with which children beg for a story, and listen while it is told, is in itself a plea for stories, and the routine of lessons should be broken up by setting apart five or ten minutes between them for this pleasant exercise.

Use of Stories.—In the first place, story-telling may be made the means of helping the children to acquire familiarity with good English. We all know how limited is the child's vocabulary, and how difficult it is for a child to express his thoughts. Sometimes when a fact is perfectly well known, the language is wanting in which he can express it.

Second, the child's sympathy may be cultivated and developed by means of stories. He becomes intensely interested in the subject of the story, and for the time being almost lives the incident over again in his own little life.

A very little child was one day listening to a story about "A lazy boy who missed a school picnic because he was so slow in getting ready. The school children were all on board the steamer, the bell rang, the moorings were loosed, and away went the boat, just as the late little boy came running down to the pier."

The little listener followed the story intently up to this point, and then burst out, "Oh! Auntie, couldn't they get a little row-boat and take him out to the steamer? I don't like him to be left behind."

Stories, then, enlist the sympathy of the child.

Third.—Story-telling strengthens the child's power of imagination. But, be careful to develop the imagination in a right direction, and not to feed it with anything coarse or cruel.

Fourth.—The stories offer opportunity for inculcating moral truths and sometimes it is possible to teach by stories truths that would be difficult to teach in any other way.

Kinds of Stories.—(*a*) *Stories of Real Life*—of events which have actually happened, or would be likely to happen. It is in this kind of story that moral truths can be illustrated most frequently.

(*b*) *Fairy Tales.*—Some people object to fairy tales, but innocent fairy tales feed the imagination, and often point a moral. Stories of horror and cruelty should never be recounted. Children soon learn to take delight in this class of story, and as a consequence, their moral tone deteriorates. Such stories as "Bluebeard" have this effect, but "Cinderella," "Sleeping Beauty," and many others, show that right is victorious in the end, and cannot have any bad effect on the children.

(*c*) *Stories of Nature.*—Flowers, rocks, trees, and other objects in nature may be made the subject of pleasant stories, interesting as a fairy tale, and many important truths may be taught in this way.

(*d*) *Stories for Very Little Ones.*—These should be exceedingly simple. A dog, a kitten, a bird, anything that comes into the life of a little child, he is delighted to hear about. Many such stories are given in the chapters on Numbers and Reading, and others will suggest themselves to the teacher. They should all be told in baby language, *i.e.*, in language that the child can comprehend. Pictures often suggest a story, which is all the more interesting for being thus illustrated.

The children should sometimes be encouraged to tell what they can remember of the story. In this way they learn to express themselves.

The Story-Teller. (*a*) We have said before that the language should be simple and easy to understand.

(*b*) The voice should be modulated, and the story-telling is much more effective when gesticulations are used. The flying of birds, the rustling of leaves, etc., should be accompanied by hand movements on the part of the Teacher.

(*c*) The story-teller should be in sympathy with the subject of the story, and also with the listeners, otherwise the interest will be lost.

(*d*) Just as pictures add interest to a story, so do illustrations on the blackboard, and these should be frequently given. Sometimes the children may be allowed to draw for themselves objects which have been mentioned in the story.

The After-Effect of Stories.—It is well to remember that the child's taste for reading is largely influenced by the class of stories told to him in early life, and in these days of plentiful, cheap literature, how important it is that the youthful mind should be trained to appreciate that which is good.

Story of an Oak Tree

"One day a little girl named Marian went out with her mother to walk in the park. They saw a great many trees, and flowers, and there was one very large tree that they looked at for a long time. It was an oak tree.

"Marian's mother told her many interesting things about the oak tree which she liked very much to hear, and then they went home.

"Next day the little girl came alone to the park, and stood looking again at the old oak tree. Then she swung on the branches until she was tired, and at last she said to herself, 'I will sit down and rest, and think of all that mother told me about this tree.'

"But the day was warm, and Marian was so comfortable, with her head leaning against the old oak, that she soon fell asleep, and then she thought that the oak tree began talking to her.

"'They call me the King of the Forest', said he. I suppose that is because I am so old and strong. My trunk is very rough and rugged, and you see it is broad at the bottom, and grows narrower at the waist, and then curves out broader again.

"'The fresh, green, dancing leaves which you see were at one time folded up in tiny golden buds. What a number of wrappings they did have, to be sure! That was to keep them warm, you know, all through the winter, for *this* year's buds were formed on my branches last year.

"'Do you see these round apples? They were buds once. How did they grow like this, do you ask? Well, a little insect came one day, she found a nice little bud, and made a hole in it. Then she laid some tiny eggs, and put round them some juice which the bud did not like at all, for it spoiled the little folded leaves. So instead of sending out pretty green leaves, the bud grew into a little house and the eggs are all inside. When the tiny grubs came out of their eggs, they will eat their way through the oak apple and so get out.

"'Do you know that the oak apples help to make the ink with which you write?

"'Sometimes a caterpillar comes and rolls himself in one of my little leaves; and in the autumn, when my nuts are ripe, the squirrel comes to visit me.'

"'Yes,' said Marian, 'your nuts are acorns, how pretty they are! each one of them has a little cup. I do not wonder that the squirrel comes to see you, for he likes your nuts so much.'"

This shows the method pursued in these stories. The oak tree would make many such.

FORM AND COLOR

In many schools a lesson is given on Form and Color at least once a week. The different forms should be kept in a box, in which there should be also squares of cardboard, showing the various colors. This apparatus should, however, be amply extended. Pieces of silk or colored paper should be kept in another box, and colored wools wound on pieces of cardboard show the colors nicely.

The Object of the Lesson.—The object of the lesson is not simply to teach the shape or color of one particular piece of wood, or cardboard, but to enable the child to distinguish the same shape or color whenever it sees an example of it. Thus the child is helped to observe and compare, and its interest in life is strengthened as it learns with joy to find out things for itself.

FORM

The Circle, or round, is the first form to be taught, and it should be illustrated by numerous examples, such as a plate, a round cake, coins, etc.; all these things should be shown to the children.

Then the circle may be compared with the ball, and the children are asked: "What things are round like the ball?" "Orange, apple, etc." "And what things are round like a circle?" "A penny, a shilling, etc." "What has the circle that the ball has not?" "The circle has two flat faces, and the ball has only one round face."

The Square is somewhat familiar to the child, who has noticed the shape of his books, and the table. It has four sides all the same length; this fact may be taught thus:

Take a long stick or ruler. Teacher says: "I will measure the sides of the square. Johnnie shall hold it for me" (measure the top edge, and cut off a piece of stick just the length). Show it to the children, and say: "This stick is just as long as the top edge of the square. I will give it to Mary to hold. Now we will measure the bottom edge" (again cut the length). "This is the length of it" (holding up the stick).

The right and left sides are measured in the same way, and the child now holds four sticks. Let the children count how many sticks there are, and notice also that all four measure exactly the same, and then they will see that the square has four sides all the same length. Then ask for objects of this shape.

The Oblong is measured in the same way as the square, and the sticks are cut the lengths of its sides. The children then see that the sticks cut to represent the sides of the oblong are not all of the same length, but that two are short, and two longer, so the oblong must have two long sides and two short sides. Let a child point to the two long sides, and another to the short ones.

Then the children are asked to name all the things they can see that are oblong in shape, such as the table, door, window. They may also name objects at home—dresser, piano, bed, and many other things.

The Oval is frequently taught after the circle, but as the difference between square and oblong is more marked than the difference between circle and oval, the former comparison if taken first may help the child to understand the latter.

Take a square and draw a circle on it, then take the oblong and draw an oval shape upon it. Ask the children, "How is this shape different from the round shape on the square?" "It is longer." "Why?" "Because the oblong is longer."

Now show the oval with the round or circle. "How is the oval different from the round?" "It is longer." "What things do you know that are shaped like the oval?" "An egg, a basket, a bathtub, a dish, etc."

The Sphere, Cylinder, Cube, Cone and Pyramid are solid figures. The cylinder can be explained from the sphere, the cone from the cylinder and the pyramid from the cube.

The pyramid points upward, so,
But it is square and flat below:
The cone is pointed, too, and round;
A sugar loaf like it is found.

The children soon learn the difference between the Cone and Pyramid, and if they are allowed to make all these solid figures in clay they will remember them more easily.

1. The oval shape is like an egg,
   The circle's round as all can tell,
   The sphere is round, just like a ball,
   The cylinder you know quite well;
2. We roll it gently on the ground,
   For it is very smooth and round;
   It has two faces flat, you see,
   And stands, as well as rolls for me.
3. The cube has six square faces, flat,
   And corners eight, just think of that!
   And edges twelve, three fours you know,
   Which round the faces always go.

The Pentagon, Hexagon, Octagon and other similar forms should be learned by drawing them on checkered slates or paper. These figures introduce the obtuse angle, and before the children learn the shapes, they should understand clearly the difference between the right, acute, and obtuse angles. The hexagon and octagon can be combined so as to make pretty designs which may be used for perforating and embroidery.

The "Forms" may be further impressed on the mind of the child by means of a Story; see the one given after "Color," at end of this chapter.

COLOR

Color should be taught if possible from objects and pictures. The six colors can be illustrated by fruits, as an orange, a rosy apple, a purple plum, a red cherry. The children's dresses, their eyes and hair, can all be brought into a lesson on color. In spring and summer flowers make charming illustrations, *e.g.*, different colors seen in roses, and the autumn-tinted leaves can be used likewise.

Then there are colors in pictures, trees, besides colored wools, beads, tablets, etc.

Ask for flowers and fruits of certain colors, *e.g.*, what flower is yellow? What fruit is red?, etc. Also colors of birds and animals, and let the children say what colors look nice together. In summer this may be shown by arranging a number of flowers in a bouquet.

In the flowers themselves colors always harmonize, *e.g.*, forget-me-not is blue, and has a yellow center, because blue and yellow look pretty together.

Spring flowers are mostly yellow, and have pale green leaves, for green and yellow look pretty together.

The red poppy and blue cornflower look pretty among the yellow corn, and there are yellow flowers among the corn also.

Harmony of color may be further illustrated by the dressing of a doll, or a story of a little girl who was taken to the shop by her mamma. The little girl was to have a new dress, cloak, and hood; what colors would her mamma choose?

Secondary Colors.—Teach that *red, blue* and *yellow* are the first or *primary* colors, from which other colors may be made. A child's box of paints and six small tumblers are required for the following illustration.

Pour a little water into each tumbler, and mix a little red paint in one, a little blue in the next, and a little yellow in the third. These are the primary colors.

Let us see what can be made by mixing *two* of them together. Take an empty tumbler. Pour in a little blue water and a little yellow. Mix together and the children will see that *green* is produced. Now take another tumbler and mix blue and red in it; this makes *purple.*

In another tumbler show that red and yellow make *orange.* "What beautiful thing have you seen in the sky showing all these colors?" "A Rainbow."

This is a most interesting lesson, and if the tumblers, etc., are not obtainable, the same experiment may be shown on a piece of white cardboard. Paint the colors in stripes on the cardboard, first the three primary, which should be allowed to stand; then the secondary are produced by rubbing one color over another, *e.g.*, paint over the red with blue, and purple is produced. Over the blue stripe paint a little yellow, and we have green. Over the yellow stripe paint red, and orange is seen.

The primary colors are Red, Yellow, Blue,
The Red and Blue mixed will show Purple to you;
Mix Yellow and Blue if you wish to make Green,
Mix Yellow and Red, then bright Orange is seen.

Color Story

After the forms and colors have been learned, they may be woven into an interesting story, thus:

"A man had a large piece of land to make into a garden; he gave a piece to each of his children, and said they might make small beds of any shape that they liked.

"So Johnnie made a *round* bed" (draw shape on board, and let children copy on slate), "and Willie had a *square* bed; Mary said her bed should be *oblong*, and Nellie made hers *oval*" (draw each on board, and let the children copy). "Then Gerty wanted hers to be the shape of a *semicircle*, and Harry said his should be very pretty, for he would make it *crescent* shape, like the moon."

When the blackboard is full of shapes the teacher might say: "Now you would like to know what these children had growing in their beds. Johnnie had a *pink* rose-bush in the middle of his bed.

"Willie sowed red Poppy seeds in rows in his square bed, and Mary had a yellow Iris in the center of hers, with blue Forget-me-nots all round. You remember that blue and yellow look pretty together."

Whenever possible, pin the flower named on the shape representing the flower bed.

The story should be continued until all the "beds" have flowers in them. The children may be allowed to suggest names of flowers and should be encouraged to choose colors that will harmonize.

THE STORY OF THE SPIDER AND THE BUTTERFLY

ON the garden wall a brown was spinning her Backwards and forwards she went, making hundreds of little threads at once, twisting them into white ropes, arranging them with her feet and the little hooks on her jaws, and gluing them together where they crossed.

The stood on a and watched.

"Is that to put your eggs in?" she asked at last. "Or do you put them on a cabbage?"

"On a cabbage! No, indeed!" said the , staring with all her eight eyes at once. "I make a soft nest of silken threads to put them in."

"That would not do for *my* babies." And the nodded her head and looked very wise. "They would get their wings fast in the threads."

"Their what?" gasped the , standing suddenly still in the middle of her .

"Their wings," repeated the innocent . "I don't think I dare let my children come to play with yours if you always hang about."

"But your children won't have wings!" gasped the again. "They won't be baby !"

The laughed gaily.

"What a funny idea!" she said. "Your eggs hatch into baby , don't they? and they don't have wings. And the hen's hatch into little baby , and they do have wings, like the hen. I saw them this morning running after her, with all their wings stretched out. I suppose they are not old enough to fly yet. When my babies can fly, I shall go back to the flower garden."

She flew away, leaving the astonished still sitting in the middle of her , trying to understand it all.

"Well!" she exclaimed to herself at last. "That's what comes of having no mother! I always did say that the family arrangements of the are the most foolish I ever heard of."

The was very busy, gumming her eggs safely underneath a cabbage leaf. Each little jar hung by its narrow end, as close to the next as could be.

"What a funny old !" she thought at last, when she had finished. "I wonder if she has finished that ."

"Have you found a cabbage to please you?" called the .

"Well, I suppose it's all right," answered the a little doubtfully. "I don't seem to be able to think of a better place to put my eggs, and I suppose the flowers will grow on the cabbage very soon. My baby will not be able to fly far at first to find honey."

"You mean your creepy, crawly !"

"Don't you mean ?" asked the , trying to be sarcastic.

"Nothing so sensible! If you want to see——"

"Hush! hush! Don't quarrel!" said the Breeze, shaking the 's , and puffing at the 's wings.

"She says that my babies will be creepy, crawly——"

"Come away! come away! Come and find some honey!" said the Breeze.

He shook the , and the fell off Then the Breeze so hurried her across the garden that when they reached the flowers she was out of breath with laughing.

"I suppose that old is jealous because her children will not be so pretty as my baby !" she said.

LADY GRAY AND THE NUTS

ONE summer Robert and his father and mother lived in a little in the woods.

They saw a running about in the .

Robert put some on the ground, and hid behind a . Soon the came and carried them away.

The next day he put the nearer the . The came again and carried them away.

So it went on for some time. Each day Robert put the nearer the .

They named the Lady Gray.

One day Robert's mother sat down on a in the porch. She put some on the floor and kept very still.

After a while Lady Gray came up on the porch. She looked at Robert's mother, then she took a and ran off as fast as she could.

By-and-by Lady Gray became so gentle that she would hunt for in their pockets.

One morning father put a on his shoulder. Lady Gray jumped on father's shoulder and ate the . How they all laughed!

CUNNING NANCY AND HER KITTENS

THREE little were born in a where there were two lively . The were at once named Tom, Dick, and Harry.

As soon as they were big enough to handle, the began to carry them round, indoors and out. Nancy, the mamma , did not like her to be handled so much, for she knew it was not good for them. She mewed, but the children did not notice her distress.

Dick, a lovely grey, seemed to be her pet. She took the best care of him, and seemed most worried when the children picked him up.

One day little Dick could not be found. The hunted for him, but in vain. They noticed that Nancy did not seem anxious, nor did she go looking for her lost .

They did not notice, however, that she would often go up the , and stay away awhile from Tom and Harry.

When washing day came, they found out all about it. In a low, dark upstairs, where the soiled clothes were kept, Nancy and Dick were found. Dick was snugly wrapped in the clothes, and purred contentedly. Mamma Nancy lay beside him. She had taken her favorite and hidden him, so that the children should not play with him.

THE GOOD LITTLE STARS

ONCE upon a time a great many little lived up in the sky.

Their father was the , and their mother was the .

Usually these were good little . They liked to help brighten the sky and so make the brighter.

But one night when their mother called to them to come and light up the sky, they came very slowly. They looked very cross. They did not shine when she told them to do so.

Mother felt sad. She called up from the some good little . They were only on , but Mother changed them into in the sky.

The naughty felt themselves falling. Faster and faster they fell, until they sank down into the .

They cried and cried until they fell asleep, for they were very sorry for what they had done.

In the morning Father shone out so brightly that everything, even the baby under the grass, wakened. They began to cry again.

Their father felt sorry for them. He told them they might shine on the .

So now the stars shine in the sky at night, and in the morning, when Father shines for them, the open their eyes and shine in the grass all day.

THE PANIC IN THE FOREST

A timid hare was resting one day in a grove of palm-trees, and a strange thought came into his head.

"What should I do if an earthquake occurred?"

At that moment a gust of wind shook the palm-trees, and some ripe fruit pattered down.

"An earthquake is beginning!" cried the timorous hare. And, starting up, he fled without daring to look behind him. A deer met him as he was racing along.

"What is the matter?" said the deer, catching up with him and running by his side.

"An earthquake is destroying the forest!" the hare gasped out.

The terrible news quickly spread among the hares, deer and rabbits, and they scampered away in wild terror. As they went on, they were joined by elks, buffalos, elephants, tigers, and rhinoceroses.

"What is the matter?" said each animal in turn, as he joined the fugitives.

"An earthquake is destroying the forest!" they panted, rushing on, and never stopping to see if it were so. At last the line of frightened animals extended across the country for a full mile. All the smaller beasts standing in the path of the army of fugitives were unable to ask any question; they had to race ahead to avoid being trampled down. But as the maddened host was sweeping blindly down to the bank of a great river, which looked like being choked up with dead bodies, a lion came up, and stopped the frightened beasts with a terrible roar.

"What is the matter?" he said to the tigers.

"The buffaloes told us that an earthquake is coming," said the tigers.

"Who saw it coming?" said the lion.

"We don't know," said the tigers. "The elephants know."

"The rhinoceroses told us," said the elephants.

"And we heard it from the buffaloes," said the rhinoceroses, panting for breath.

The buffaloes heard it from the elks; the elks heard it from the deer; and at last it got down to the timid hare.

"Do you mean to tell me," roared the lion, "that you have all been frightened to death by a timid little hare? Let us go to the grove of palm-trees, and witness this terrible earthquake."

When they arrived there, the fruit was still pattering to the ground.

"Now, you see," said the lion, "what comes of following the lead of the most timorous creature on earth. He has made you all more cowardly than he is himself. You ran away without even hearing the noise that frightened him. Henceforward avoid the gossip of the crowd, and trust to your own judgment.

THE JOURNEY FROM THE CLOUDS TO THE SEA

When the little drop of rain fell, he didn't know in the least what was going to happen. For a minute or two he felt quite frightened. Then he suddenly found himself rolling down a hill. He had just begun to think it great fun, when he noticed a lot of other drops beside him, all laughing together and all rolling down the hill.

One of them came close to him and touched him, and he found himself growing bigger. Then more and more came up, and presently he saw that he was quite a big fellow. He felt very proud of himself. "I'm getting bigger and bigger every minute," he said.

Half-way down the hill he looked back, and saw himself stretched out like a line of silver, glittering and shining between the trees and stones and bushes.

"I'm a stream now," he murmured proudly as he hurried over sand and gravel and clay, "and I'm getting bigger and bigger still."

Suddenly he found himself falling over a big black rock. Down, down he fell, thirty feet or more. But he was so big and strong now that he didn't care a bit.

At the bottom of the hill there were a great many rocks and stones right in front of him. "Get out of my way!" he roared. "I'm a river now! Get out of my way!" And he dashed and splashed and flew right over them.

A little farther on he came to a lovely meadow, with beautiful trees hanging down, and birds singing, and great sleepy red cattle standing knee-deep in the long, sweet grass, and the big blue sky shimmering overhead. It was so very, very pretty that he thought he would stay here a while. So he twisted and wound round and round, just to get another look at the trees, and to watch the birds flying from branch and bush.

He laughed merrily to a little boy who was standing on the bank with a fishing-rod in his hand, and hurried on again.

As he turned a corner quickly he saw a great blue plain stretching for miles and miles, with ships and boats and birds dotted here and there on its broad, heaving, shining surface.

"Hello! There is the sea at last!" he cried joyfully, and rushed forward eagerly to meet it. And as he joined the great ocean he shouted out as if he meant that all the world should hear, "Here I am; I'm a sea now!" (See full page illustration on page 68.)

THE SPIDER AND THE FLY

The spider was in a rare temper as she hurried back to the dark corner where she had her home.

"Upon my word," she muttered, "it is too bad! This is the third time that wretched housemaid has swept my web away. The ignorant creature calls me an insect. I am not an insect. My body is in two parts instead of three; my head is part of my chest; and I have eight legs instead of six."

The spider sat in her dark corner thinking very hard. Presently a buzzing sound caught her ears, which happened to be placed at the end of her feet. Her six pairs of eyes glistened with anger.

"There's that old bluebottle again," she murmured. "His noise makes my head ache. If I make haste and spin another web, perhaps I can catch him before the maid comes with her broom.

Having made up her mind, the spider began. On the underpart of her body were four tiny tubes, each with about a thousand still tinier holes. From each tube came a thousand delicate threads made of a gummy fluid. The spider's hind feet combed and twisted them into one fine thread.

The thread gradually increased in length until a draught caught it and carried it to the edge of the window-curtain, to which it clung.

Several other threads were then stretched from point to point.

"Now," said the spider, "I can go on building my web."

Line after line appeared as if by magic. The lines crossed and recrossed, and at every point where they touched a tiny drop of sticky fluid held them firmly together.

The spider viewed her work with satisfaction.

Lastly, she ran a more delicate thread round and round in spiral fashion. At

the end of an hour the web was complete.

"Now I will test it," said the spider; and she tried her work here and there, and found it quite good.

Only a short time passed before the big fly buzzed into the elastic strands. The more he struggled, the more he became entangled.

The spider was hungry and very impatient. She darted from her lair and seized the fly with her terrible claws.

At the end of the feelers were tubes from which she poured poison into the body of her prisoner, while with her fore feet she entangled still further the fly's legs and wings.

In a few moments the bluebottle was quite still. Securely bound up in the sticky strands, bitten and poisoned, it was clear that he would never again buzz about in the sunshine. Then the spider enjoyed a better meal than she had had for a long time.

An hour later the housemaid came along, and, catching sight of the web, she flicked it with her duster.

"That miserable insect has been at its tricks again," she said.

The spider was just settling down to a quiet nap after her hearty meal. She did not like being disturbed, but it did not matter so much now. She simply smiled to herself. (See articles on Spiders; Flies and Insects in general in Book of the Animal Kingdom.)

THE STORY OF PETER PAN

Every child in the world grows up to be a woman or a man. The only one who doesn't grow up, and won't, is Peter Pan. He always stays a little boy, which is very jolly indeed, and he's friends with all little boys and girls,—as you'll understand if you read.

The Darlings,—Wendy, John, and Michael,—lived with their father and mother. They were rather poor, but it didn't matter, they were all so fond of each other. They'd a little maid called 'Liza, and, because they hadn't the the money for a proper nurse, they'd a dog instead, named Nana,—wasn't it funny?

Peter Pan came every night; the window blew open wide, and in he hopped, without a sound, and hurried to Wendy's side. And a curious little dancing light came in with Peter as well; this was a fairy lady, and her name was Tinker Bell. Peter was dressed in skeleton leaves; he had pipes on which he played—a delightful person. Wendy was not the least little bit afraid. He talked to her of the Never-Land, where she'd always wanted to go. And he said, "If I only teach you to fly, you can get there now, you know!" So John and Michael were taught to fly, and Wendy too, and they found it's as easy, when you get used to it, as walking on the ground. And at last, when both their father and mother were out, one Friday night, the Darling children and Peter Pan and Tinker Bell took flight. Away in their little nightgowns they flew, as fast as they could go, till they came to the island, the Never-Land, where all the adventures grow.

Now in this island, I must tell you, were wonderful things to find: unknown birds, and curious beasts, and Redskins, fierce but kind. Fairies were there, and Mermaids, and Wolves,—some wild, some tame; and a Crocodile that had swallowed a clock, and ticked wherever it came. But—hush, let us whisper!—the "Jolly Roger," a rascally pirate craft, with raking masts, and swelling sails, and guns both fore and aft, was anchored there, and the hideous crew were lying in wait, each man, and the captain, Hook, in particular, to kill little Peter Pan. Hook was not his real name; Peter, some while ago, in open fight, had cut off his hand, so now he'd a hook, you know. And as, with a stern and gloomy air, he paced, on his quarter-deck, he was thinking all the time, "I'd like to wring that Peter's neck!" And the rest of the horrible band of Pirates were always prowling about, to see if they couldn't capture Peter, and kill him, without a doubt. They crept along, singing "Yeo-ho-ho"—as stealthily as could be, they, and the bo'sum, who, indeed, was the best of them—one Smee. But the Redskins, with the tomahawks, were on the Pirates' track, and followed them quite noiselessly,—not a single

PETER PAN, WHO COULD NEVER GROW UP TO BE A MAN

rustle or crack. For they thought the world of Peter Pan; in fact, they all were rather inclined to kneel at his little feet. And they called him "Great White Father."

Upon the island there were also some boys—well, counting rightly, there were six: Nibs, Tootles, Curly, and the Twins (no names), and Slightly. And Tootles, by a silly mistake, when he saw the Darlings near, hastily aimed his swiftest arrow, and drew his bow to his ear, and shot poor Wendy. Just at first she was thought to be dead, by her friends. But, finding she wasn't, they built her a house, in the hope of making amends. They built it right, round her, with branches, leaves, and moss, and lovely make-believe roses clambering quite across. And when it was com-

pleted (and it looked remarkably fine), "Oh, Wendy, do be our mother!" they cried, and they hadn't to ask her twice. "Come in at once, you naughty children!" Wendy delightedly cried; and they all squeezed in, except Peter Pan, who stayed upon guard outside.

There was also a beautiful house under-ground, where elegant mushrooms grew, and a Never-tree also (but every morning they sawed the trunk right through). You entered the house by hollow trees, going up and down quite fast, which was hard at first, but the children did it exceedingly well at last. And here, in the charming underground house, the eight boys slept alone in a great big bed,—for Wendy lived in that dear little house of her own. But every evening she told them stories, and when the stories were done, they'd have a dance in their night-clothes, and a pillow fight,—Oh, such fun! Peter Pan wasn't always there, because, as you understand, he was busy strolling about the island, or watching with sword in hand. But in the day-time he would come, and take them, not very far, to the blue lagoon, where the weedy rocks and the hundreds of Mermaids are.

And here, one day, both Peter and Wendy received a bit of a shock; for Hook pursued them, and so they climbed on a rock—the Marooners' Rock. Wendy fainted, and so did Peter. A Mermaid came to see whoever those two little dripping folks on the slippery rock could be. Then Peter perceived the tide was rising, and he tied up Wendy tight to the tail of a kite which was drifting near, and sent her away with the kite. And there he stayed on the rock alone, and he thought he'd be drowned each minute. But the Never-Bird, in her floating nest, came up, and Peter got in it, while the Never-Bird took to a Pirate's hat, which was luckily close at hand. So Peter went gaily sailing off, and arrived quite safe at land.

Now every night the Redskins were camped above the underground house. And every night the Pirates were creeping, each as still as a mouse (with the terrible Crocodile after them, showing its crunching teeth), while Wendy was cheerfully telling tales to the children down beneath. But, oh dear me! there came a night when that treacherous pirate Hook contrived to surprise the Redskins, and the children; and he took the whole nine children prisoners, exceedingly sad to tell. The only ones who made their escape were Peter and Tinker Bell. And while the unhappy children were roughly carried on board, Peter was off to rescue them, with his trusty dagger and sword. And, just in the nick of time, he arrived. He armed the boys, and they slew, after a most tremendous fight, fifteen of the Pirate crew. And after a thrilling duel, which lasted a very short while, between Hook and Peter, the wicked Hook was thrown to the Crocodile.

So Peter took command of the ship, and they all sailed home, and then, how glad their father and mother were, to have them back again! They all were dressed in the Pirates' clothes (cut short), and exceedingly grand; and oh, what tales they had to tell of the wonderful Never-Land! Peter, who didn't like houses at all,—brick ones, and that sort of thing, returned to the Never-Land by himself. But he comes back every spring, and fetches Wendy to help him do spring-cleaning, and Wendy stops and tidies up the little house, which is now in the high tree-tops. As for the boys, they've all grown up, so the Pirates' clothes won't fit. And as for the great adventures they had, they've forgotten them every bit. Only Wendy and Peter Pan can still do just as they please. How happy they are, as they talk up there in the dear little house in the trees!

COUNTING AND NUMBERS

In numbers, as in other primary subjects, a child should be *taught* and *permitted* to do things himself. Rousseau said, "What the child *does*, it easily remembers"; and we shall soon find that time spent in this way is far from being wasted.

Children who have been taught numbers gradually, in this easy, interesting fashion, develop an astonishing aptitude for dealing with figures as they grow older.

Counting

Learning to count 1, 2, 3, 4, etc., parrotlike, does very little good. Rather let the child count *objects* and point out 5 marbles, 6 blocks, etc., in order that you may determine if he knows exactly what 5 or 6 of anything means.

Take a number of blocks or marbles and ask the child to take 3, 5, 7, or any number of them.

Hold up 3, 5, or 6 of them and ask him to tell how many you have. When you are told the *number* you have, write the *figure* which tells the number on paper, or the blackboard. Have the child copy the figure, making a large character.

Then reverse the work by writing a *figure* on paper and asking the child to take the *number of blocks* the writing asks for.

Spend a few minutes every day in asking him to show you 2 pins, 3 houses, 5 stripes, etc.

Teach the child to count 50 as soon as he has started in his number work at school and later on to 100. *Objects* should be counted at first and then counters substituted, such as pennies, marbles, blocks, beads, etc.

Recognition of Numbers.—The purpose of *counting objects* is to give the children a clear idea of *number*. They should be able to recognize 2, 3, 4 and 5, *i.e.*, be able to tell four objects when they see four, without counting them, also 3, 5, etc. Stories and games with objects should be repeated again and again, until the children can do this easily.

Analysis of Numbers.—When the numbers can be recognized without difficulty, the children should be encouraged to analyze them, *i.e.*, tell what they are made up of, but objects should be put in front of the class to represent the numbers until they can do this readily.

Suppose the number *five* to be the lesson, each child would take five shells out of its box, and lay them on the desk, thus:—: :· or ⁝ : or :· : etc. The child should always be able to *describe* what it has done: thus, the first child would say—*four shells* and *one shell* are *five*; the second, *three shells* and *two shells* are *five*, and so on.

Higher Numbers.—The analysis of six, seven, eight and nine may be taught in the same way, each number being taken separately and thoroughly mastered, before proceeding to the next. The children should learn all the different combinations of numbers that make six—*three* and *three*, *five* and *one*, *four* and *two*, *three twos*, etc.—but always with the objects, and when they have seen the number analyzed by the Teacher, they should do it for themselves with shells, bricks or other objects.

Number Ten.—This is the most important number of all, and it should be thoroughly well taught. The Teacher should show on the table the different analyses that can be made of ten, and the children should lay these with shells or other objects again and again. It is necessary to learn these perfectly, for however well any or all of the numbers may be learned, they are comparatively useless without ten.

Figures.—When the figures are introduced they should invariably be shown with the concrete numbers which each figure represents. They say, "Here are four balls" : : "I will show you a figure that means those four balls, **4**, and I will put the four balls beside it, thus:"—**4** : :

Number on Paper or Slates.—If the children have learned how to use a pencil, they may transfer the number-pictures made with shells to their slates, using dots for "shells," thus:— : : :

Then another "picture" may be made with the shells : : : and this be copied on the paper at some distance from the other. Then another is made and copied, and so on until the child sees on his paper all the combinations of numbers that go to make six. He should be able to read them all out, and because a child remem-

bers what he has done himself, it will be found that numbers taught in this way are seldom forgotten.

As the children become more proficient, the two signs + and = may be taught, + means *and*, = means *are*. Then they may put on their slates : + : = : : and use these signs in the analysis of other numbers.

Money Taught as Numbers

When the children know numbers up to ten, they might play little "shopping" games with coins. Show them actual coins in teaching money. Lessons on money should be given frequently after the first year of school life.

Begin by teaching the value of the *cent* and the *nickel*, then the *dime*, then the *quarter*, then the *half-dollar*, and then the *dollar*.

Make little problems involving change. Develop the ability to make change rapidly. The child may have some money of his own and he should be taught the comparative values of the coins.

Simple Table of Money

10 cents make 1 dime.
2 five-cent pieces make 1 dime.
100 cents make 1 dollar.
A quarter of a dollar = 25 cents.
A half-dollar = 50 cents.
$ means dollars and c means cents.
A 5-cent piece is called a nickel, because it is made of nickel.
A cent piece is made of copper.
The other coins named are made of silver.
(See United States Money for more advanced instruction.)

COMBINATIONS OF NUMBERS

We now come to the method of teaching the combinations in Addition and Subtraction.

We can count books, tables, and houses and say that we have counted so many *things* but we do not *add* books, tables, and houses. We *add* books and books, tables and tables, houses and houses.

We count by *ones*. When we add three beads and two beads we are counting by ones, for it means that we are adding three ones of beads and two ones of beads, making five beads in all.

From **1** to **9** we use only one figure to tell how many we mean. When we wish to say in writing that we have ten of anything we write a **0** after the **1** and have **10**, ten.

1. Add 1 to every number up to 10; later to 20.

2. Subtract 1 from every number up to 10; later to 20.

3. Add:

2	3	4	5	6	7	8	9	10
+2	+3	+4	+5	+6	+7	+8	+9	+10

Here the addends are equal and easily added. The figures should be placed as above and not 2+2, 3+3, etc., because the vertical form is the natural one which the child will use all through life. It does not look so formal and represents better what he really does with the objects.

4. Add:

1	2	3	4	5	6	7	8	9
+2	+3	+4	+5	+6	+7	+8	+9	+10

Here one addend exceeds the other by 1.

5. Subtract:

2	3	4	5	6	7	8	9	10
−1	−2	−3	−4	−5	−6	−7	−8	− 9

Here the minuend is one greater in each case.

6. Teach the parts of 10.

5	2	3	4	9
+5	+8	+7	+6	+1

7. In adding 9 to numbers have the child think of 9 as 10,

thus $\begin{array}{r} 9 \\ +6 \end{array} = \begin{array}{r} 10 \\ +5 \end{array}$ and $\begin{array}{r} 9 \\ +8 \end{array} = \begin{array}{r} 10 \\ +7 \end{array}$

8. Teach the corresponding subtractions.
9. Add 8 to each number up to 10.
10. Teach the corresponding subtractions.
11. Add 7, 6, and 5 to each number up to 10.
12. Teach the corresponding subtractions.
13. Review and give combinations not taught above.

Objects should be grouped by tens and units, in showing numbers above *ten*. Ten should be the basis of all our reckoning, and if the children know ten, and the numbers which precede it, they can soon be taught the rest. Little children should not have "sums" given them to do on their slates, for "sums" are made up of *abstract* figures, and children of tender years cannot grasp the abstract.

Number to One Hundred.—When the children are conversant with numbers up to ten, it is very easy to teach them one hundred.

PRIMARY IDEAS OF DIVISION

In teaching the two ideas of division—division by *measurement* (division proper) and the *fractional* idea of division (partition)—proceed very slowly and see that each step is thoroughly understood.

The following suggestions may be useful:—

Division by Measurement

Use blocks or any other counters in illustrating the process.

Example:

4 | 12

The teacher should ask the child, "How would you count this story?"

Facts Given by Child

12 = whole number of blocks.
4 = number in each part.
We want to know the number of parts.

We place the blocks so, 4 in each part:—

There are 3 parts.

DIVISION BY PARTITION

Make use of blocks or substitutes to show the process here.

EXAMPLE: ¼ of 12 = 3.

The teacher should ask the child, "How would you count this story?"

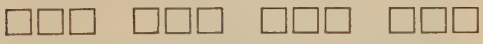
Facts Given by Child

12 = whole number of blocks.
4 = number of parts.
We want to know the number in each part.

We place the blocks so, as we know there are 4 parts:—

We have put one in each part.

Now we will put one in each part until the 12 blocks are gone:—



There are 3 in each part.

NUMBERS IN MULTIPLICATION

EXAMPLE:

$3 \times 4 = —$

Facts Given by Child

3×4 means 3 4's.
I count my blocks by fours—I take 1 four, another, another.
I find that 3 4's are 12.
$3 \times 4 = 12$.

To the Teacher:

Now the child is ready to give a number story about 3×4.

PRIMARY MEASURES FOR CHILDREN

The child has been taught to count. Now while he is telling you *how many* objects he is dealing with, teach him to tell *how much* he is dealing with.

In other words, have the child *measure and compare* as well as count.

Ideas of larger and smaller, longer and shorter, and the like, should be made important. The need at the outset, is to learn, in a simple way, the basis of all arithmetic—the *comparison* of *quantity*, —in as many of its forms as possible.

MEASURES OF LENGTH

Teach the child to estimate distances and then to verify every estimate by actual measurement.

Teach half inches as well as inches.

Long measure is used to measure length.

12 inches make 1 foot.
3 feet make 1 yard.
in. means inch or inches.
ft. means foot or feet.

For the Child to Do:

1. Cut a strip of paper 12 inches long and 1 inch wide.
2. Mark the inches on it.
3. How many inches long is it?
4. What do you call a measure 12 inches long?
5. Draw a line 2 inches long, as near as you can, without using a ruler.
6. Measure it with a ruler. Did you guess nearly right? Try again.
7. Measure this page. How long is it? How wide?
8. Draw a line on the ground 1 yard long.
9. ½ of a foot is how many inches?
10. 1 yard is how many inches? What is measured by the yard?
11. Ask your mother how many yards of cloth she needs for a dress.
12. What is measured by the foot?
13. How tall are you?

TELLING THE TIME

First—Teach him to tell the hour hand from the minute hand.

Next—Teach him when he first looks at the dial, to find the hour hand and then notice which Roman Numeral it is nearest. *This will tell about what time it is.*

Then—Find the minute hand. *The minute hand will tell exactly what time it is.*

TO ILLUSTRATE: Take this clock. The hour hand is near the Roman Numeral II., which stands for 2. Tell the child it is somewhere near two o'clock.

The minute hand will tell how near.

What time is it?

It must always point to the XII. before it is exactly the hour. If it is one numeral away

from the XII., toward the left, it is 5 minutes of two. If it is two numerals away to the left it is 10 minutes of two, etc. If it is one numeral away to the right, it is 5 minutes after two, etc. Proceed in this way and keep at it.

The Day

A new day begins at midnight and lasts until the next midnight.

Midnight is the middle of the night; that is, 12 o'clock at night.

Noon is the middle of the day, that is, 12 o'clock in day time.

One hour after noon is 1 o'clock, 2 hours after is 2 o'clock, etc.

If a person says he was at a certain place at 2 o'clock, he must say forenoon or afternoon, so we will know which half of the day he means. If it was 2 o'clock in the morning he would write 2 A.M., and if 2 o'clock in the afternoon, 2 P.M.

Things for the Child to Do:

1. Name the days of the week and the months of the year.
2. What day of the week does Christmas fall on this year?
3. Is 22 days longer than 3 weeks?
4. Is 5 weeks longer than a month? How much?
5. How many days in 3 weeks?
6. On what day of the week will your next birthday be, etc.

Remember:

The days of the week in their order.

The months of the year in their order.

Procure a calendar for the child to own.

A good way to make him familiar with the use of the days of the week and month, as found on a calendar, is to ask him to look up and tell on what day of the week the next Fourth of July will fall; Christmas; New Year; his birthday.

Have him distinguish between the day of the week and the day of the month.

7 days make 1 week.
30 days make 1 month.

Days of the Week	Months of the Year
Sunday	March
Monday	April
Tuesday	May
Wednesday	June
Thursday	July
Friday	August
Saturday	September
Months of the Year	October
January	November
February	December

THE CALENDAR

1903		July				1903
Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
First Quar. 1st 30th	Full Moon 9th	Last Quar. 17th	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	New Moon 23d

ELEMENTARY APPLICATION OF NUMBERS

READING NUMBERS

When we spell a *word*, that is, when we read the letters in the word, we read from *left* to *right*.

To read a *number* we do the same thing, for we read the figures from left to right.

325 is read "three hundred twenty-five."

The number is read differently if we wish to tell the *place* and *value* of a certain figure, for then we read the figures themselves from *right* to *left*, thus:—

325 means 5 units, 2 tens, 3 hundreds.

Never use "AND" in reading whole numbers.

325 should never be read "three hundred and twenty-five," but "three hundred twenty-five."

Numbers between 100 and 1000 are read by naming the hundreds, tens, and units in succession. Thus—

192—one hundred ninety-two.
652—six hundred fifty-two.
207—two hundred seven.

Above 1000

Read 1,892,632.

Here the 2 represents 1's, or units of the first order.
the 3 represents 10's, or units of the second order.
the 6 represents 100's, or units of the third order.
the 2 represents 1000's, or units of the fourth order.
the 8 represents 100000's, or units of the sixth order, etc., etc.

The order of any figure is the number of its place, starting from the right.

In reading large numbers we arrange the orders into groups of three figures each.

We call each group a period. Commas are used to keep the periods separate.

Names of the Periods

units,	billions,	quintillions,	octillions,
thousands,	trillions,	sextillions,	nonillions,
millions,	quadrillions,	septillions,	decillions.

trillions	billions	millions	thousands	units
225,	902,	302,	472,	399.

FUNDAMENTAL OPERATIONS

Addition is the method for finding a number equal to two or more numbers taken together. The result of adding two or more numbers is called their *sum*.

The sign +, called plus, written between two numbers, denotes that they are to be added together.

The sign = is an abbreviation for "is equal to" or "equals."

EXAMPLE: Add together 1097; 48214; 34; 7916. We first add the units, 7+4+4+6=21, *i. e.* 2 tens+1. We carry—*i.e.* include—these 2 tens with the tens in the given numbers; thus 2+9+1+3+1=16 tens, =1 hundred+6 tens. Carry this 1 hundred, and add it with hundreds, and so on. It is convenient to write down the given numbers under one another so that units come under units, tens under tens, and so on—drawing a line under the last number.

Thus:

1097	Say, mentally,	
48214	6, 10, 14, 21;	carry 2,
34	3, 6, 7, 16;	carry 1,
7916	10, 12;	carry 1,
	8, 16, 17;	carry 1.
57261 *Ans.*	5	

FACTS ABOUT ROMAN NUMERALS

The following facts about the origin and development of Roman notation can be made very interesting, and will tend to fix the characters in one's mind—

At first one was written.....I
two was written.....II
three was written.....III
four was written.....IIII
five was written.....IIIII
six was written.....IIIIII
seven was written.....IIIIIII
eight was written.....IIIIIIII
nine was written.....IIIIIIIII

It took too long to make ten marks, and too long to count them after they were made, so one mark with another across it was used to denote 10, thus X. The upper or first half of the X, or V, was used to show 5.

At first twenty was written.....XX
thirty was written.....XXX
forty was written.....XXXX
ninety was written....XXXXXXXXX

It took too long to make the crosses and too long to count them in reading, so Ⅰ was used to show 100. Half of the Ⅰ, or L was used to show 50. The Ⅰ gradually became C in trying to make the Ⅰ rapidly.

Write these where they can be seen plainly:

I = 1	XX = 20	XXXIX = 39
II = 2	XXI = 21	XL = 40
III = 3	XXII = 22	XLI = 41
IV = 4	XXIII = 23	XLII = 42
V = 5	XXIV = 24	XLIII = 43
VI = 6	XXV = 25	XLIV = 44
VII = 7	XXVI = 26	XLV = 45
VIII = 8	XXVII = 27	XLVI = 46
IX = 9	XXVIII = 28	XLVII = 47
X = 10	XXIX = 29	XLVIII = 48
XI = 11	XXX = 30	XLIX = 49
XII = 12	XXXI = 31	L = 50
XIII = 13	XXXII = 32	LX = 60
XIV = 14	XXXIII = 33	LXX = 70
XV = 15	XXXIV = 34	LXXX = 80
XVI = 16	XXXV = 35	XC = 90
XVII = 17	XXXVI = 36	C = 100
XVIII = 18	XXXVII = 37	
XIX = 19	XXXVIII = 38	

ELEMENTARY PRACTICE IN ADDITION

The following plan is suggested for learning the combinations in addition:—

1. Add 1 to every number up to 10; later to 20.

2. Add:

2	3	4	5	6	7	8	9	10
+2	+3	+4	+5	+6	+7	+8	+9	+10

Here the addends are equal and easily added. The figures should be placed as above and not 2+2, 3+3, etc., because the vertical form is the natural one which we use all through life.

3. Add:

1	2	3	4	5	6	7	8	9
+2	+3	+4	+5	+6	+7	+8	+9	+10

Here one addend exceeds the other by 1.

4. Learn the parts of 10.

5	2	3	4	9
+5	+8	+7	+6	+1

5. In adding 9 to numbers think of 9 as 10.

9	10		
thus +6 = + 5	and	+8 = + 7	

6. Add 8 to each number up to 10.

7. Add 7, 6, and 5 to each number up to 10.

8. Review and form combinations not given above.

Note.—Objects should be grouped by tens and units, in showing numbers above 10. The numbers written should represent objects counted.

THE FORTY-FIVE FACTS OF ADDITION

1	2	2	3	3	4	3	4	5
1	1	2	1	2	1	3	2	1
2	3	4	4	5	5	6	6	6
4	5	6	4	5	6	7	5	6
3	2	1	4	3	2	1	4	3
7	7	7	8	8	8	8	9	9
7	8	5	6	7	8	9	6	7
2	1	5	4	3	2	1	5	4
9	9	10	10	10	10	10	11	11
8	9	6	7	8	9	7	8	9
3	2	6	5	4	3	6	5	4
11	11	12	12	12	12	13	13	13
7	8	9	8	9	8	9	9	9
7	6	5	7	6	8	7	8	9
14	14	14	15	15	16	16	17	18

Note.—Be sure that the nine facts underscored are thoroughly learned. They give most trouble.

RAPID ADDITION MADE EASY

Every business has more or less to do with figures. It is very important, then, that we should be accurate and rapid in *addition*. One small error in footing up an account may throw the total out several hundred dollars. Let accuracy be the first consideration, then drill, drill, drill, until you can add rapidly. Rapid adders are usually the most accurate. Note the following suggestions:—

Write the numbers in vertical lines. Irregularity in placing of figures is the cause of many errors.

Think of results, and not of the numbers themselves. Thus, do not say, 4 and 5 are 9, and 6 are 15, and 7 are 22, etc.; but, 9, 15, 22, etc.

Make combinations of 10, or other numbers, as often as possible, and add them as single numbers. Thus, in adding 9 34 73 214 9 54 82 123, say, 9, 16, 26, 33, 42, 51, 61, 67, taking each group, at a glance, as a single number. Where a figure is repeated several times, multiply instead of adding.

In adding horizontally, begin at the left, since the eye is more accustomed to moving from left to right than from right to left.

In adding long columns, prove the work, by adding each column separately in the opposite direction, before adding the next column.

When numbers are in regular arithmetical order—as 3, 4, 5, 6, 7, or 2, 4, 6, 8, 10, or 5, 10, 15, 20, etc.—to find their sum, add the first and last, take half, and multiply by the number or numbers. The half-sum represents the middle or average number.

TEST EXERCISE

Note.—Business men, and accountants, find it necessary to be able to add readily amounts when placed in a horizontal position, as well as when placed in a vertical position. In the following exercise, add both ways, and then prove the work by adding the results.

$246.00 +	$1024.60 +	$24.31 +	$3.72 =	**** **
39.85 +	319.24 +	63.84 +	4.96 =	**** **
412.40 +	2108.50 +	.03 +	2.12 =	**** **
31.60 +	316.42 +	2.41 +	3.24 =	**** **
*** ** +	**** ** +	** ** +	* ** =	**** **

CIVIL SERVICE METHOD OF ADDING

Employes under the civil service bureau, bank clerks, and others who perform additions while surrounded by people engaged in conversation, use the following method.

This method is safe because one can detect and change an error very quickly.

$5280	16
9760.50	21
349	19
4006.75	23
6522.89	18
132.12	24
	$26,051.26

THE BANKERS' METHOD OF ADDING

This method is the same as that used by the civil service employes, with one change. In adding the columns the number carried is "added in" to each partial sum.

$5280	*16*
9760.50	*22*
349	*21*
4006.75	*25*
6522.89	*20*
132.12	*26*
	$26,051.26

The banker's method is an improvement on the civil service method as it does not require a second addition. The number to be carried is always in sight in the bankers' method, being the tens figure of the last partial sum written. The sum can be written at once.

To prove addition.—Add the columns in opposite directions.

Subtraction is the method for finding what number is left when a given number is taken away from a larger given number.

The result of subtracting one number from another is called their difference.

Plainly the difference between two numbers is the number which must be added to the smaller to make it equal the greater.

The sign —, called minus, written between two numbers, denotes that the second is to be subtracted from the first.

EXAMPLE: Subtract 1287 from 40529.

We have to find the number which, when added to 1287, will make 40529.

Write the smaller number under the larger, with the unit's figure under the unit's figure, etc., as in addition. Then, 2 added to 7, make 9. Put down 2. Next, 4 tens added to 8 tens make 12 tens. Put down 4, and carry 1 (*i.e.* 1 hundred). In this step we have made the eighty in the smaller number up to one hundred and twenty, and this one hundred is added to the 2 hundred in the smaller number. Hence, in the next step, we say 2 hundreds added to 3 hundreds make 5 hundreds. Put down 2. Next, 9 thousands added to 1 thousand make 10 thousands. Put down 9 and carry 1. Finally, 3 ten-thousands added to 1 ten-thousand, make 4 ten-thousands. Put down 3.

Thus:	Say, mentally,
40529	7 and 2 make 9,
1287	8 and 4 make 12, carry 1,
	3 and 2 make 5,
39242 *Ans.*	1 and 9 make 10, carry 1,
	1 and 3 make 4.

By using the above method for subtraction it becomes a very simple matter to subtract the sum of several given numbers from another given number (greater, of course, than that sum). The student will see the importance of making himself thoroughly familiar with this method when he gets to "long division."

EXAMPLE: Subtract the sum of 1092, 20875, and 435, from 50171.

Put the figures down exactly as in addition, putting the 50171 first, and separating it by a line from the numbers below. Add the three lowest digits in each column, and make the sum up to the top line.

50171	Say, mentally,
	5, 10, 12, and 9 make 21, carry 2,
1092	5, 12, 21, and 6 make 27, carry 2,
20875	6, 14, and 7 make 21, carry 2,
435	3 and 7 make 10, carry 1,
	3 and 2 make 5.
27769 *Ans.*	

ELEMENTARY PRACTICE IN SUBTRACTION

The differences of all these combinations should be learned so thoroughly that it will be easy to name the difference of any combination on sight. This will take time, but it is time well spent.

Use devices similar to those used in the drills on the addition table. Make many problems and give the difference in each case.

COMBINATIONS IN SUBTRACTION

1	2	3	4	5	6	7	8	9	10
—**1**	—1	—1	—1	—1	—1	—1	—1	—1	—1
—	—	—	—	—	—	—	—	—	—
2	3	4	5	6	7	8	9	10	11
—**2**	—2	—2	—2	—2	—2	—2	—2	—2	—2
—	—	—	—	—	—	—	—	—	—
3	4	5	6	7	8	9	10	11	12
—**3**	—3	—3	—3	—3	—3	—3	—3	—3	—3
—	—	—	—	—	—	—	—	—	—
4	5	6	7	8	9	10	11	12	13
—**4**	—4	—4	—4	—4	—4	—4	—4	—4	—4
—	—	—	—	—	—	—	—	—	—
5	6	7	8	9	10	11	12	13	14
—**5**	—5	—5	—5	—5	—5	—5	—5	—5	—5
—	—	—	—	—	—	—	—	—	—
6	7	8	9	10	11	12	13	14	15
—**6**	—6	—6	—6	—6	—6	—6	—6	—6	—6
—	—	—	—	—	—	—	—	—	—

7	8	9	10	11	12	13	14	15	16
—7	—7	—7	—7	—7	—7	—7	—7	—7	—7
—	—	—	—	—	—	—	—	—	—
8	9	10	11	12	13	14	15	16	17
—8	—8	—8	—8	—8	—8	—8	—8	—8	—8
—	—	—	—	—	—	—	—	—	—
9	10	11	12	13	14	15	16	17	18
—9	—9	—9	—9	—9	—9	—9	—9	—9	—9
—	—	—	—	—	—	—	—	—	—
10	11	12	13	14	15	16	17	18	19	20
—10	—10	—10	—10	—10	—10	—10	—10	—10	—10	—10
—	—	—	—	—	—	—	—	—	—	—

The Computers' Method

In making change the method below is nearly always used. Computers find it the more practical way. It gives greater rapidity and accuracy than the other method.

Many use it alone in teaching subtraction.

This plan is called the Austrian method by some.

Example: Find the difference between 725 and 432.

Work: Explanation: Let the learner imagine he is adding with the sum written above. He inserts the missing figures to form the sum as he works, 3, 9, 2. He thinks of 2 and 3 as 5; 3 and 9 as 12; 5 and 2 as 7. He may talk it this way: 3 and 2, 5; 9 and 3, 12; 3 and 4, 7.

```
725
432
293
———
```

Use that method with these examples:—

42,936	2034	7825	6243
−17,245	−1456	−1504	−1428
25,691	578	6321	4815

Note.—With practice the learner will come to prefer this method and should be helped in its use. It is practical, since conducive to both rapidity and accuracy.

How to Make Change

Salesmen usually *make change* by a combination of addition and subtraction. They have the money to count out, and in doing so they add to the amount of the purchase until they reach the amount of the bill presented. For example, if you buy something worth $3.35 and present a ten-dollar bill in payment, you will probably receive in return 5 cents, 10 cents, 50 cents, $1, and $5; the salesman saying 40, 50, $4, $5, $10. This method is least liable to error.

Accuracy and rapidity in counting out change can best be acquired by practice behind the counter or at the cash-desk. In the exercises immediately below, the amount of the purchase and the amount of the bills presented are given, and it is required to find the amount of change to be returned. Do the work without pen or pencil.

Exercises

1. $10.00 − $3.14
2. $15.00 − $2.13.
3. $30.00 − $9.94.
4. $10.00 − $7.16.
5. $20.00 − $2.95.
6. $5.00—$1.90.
7. $1.00 − $0.45.
8. $2.00 − $1.20.
9. $2.00 − $1.03.
10. $7.00 − $5.19.
11. $40.00 − $23.18.
12. $25.00 − $15.65.
13. $20.00 − $13.21.
14. $15.00 − $11.15.
15. $50.00 − $22.68.

Proofs of Subtraction

To prove a subtraction add the subtrahend to the remainder. The result will be the minuend if the work is correct.

Example	Proof
425 minuend	173
—173 subtrahend	252
252 remainder	425

425 is the same as the minuend, hence the work is correct.

Another Proof

Take the remainder from the minuend. If the work is co rect the subtrahend will be left.

If in the last example given we write

```
 425
—252
————
```

we get 173, which is the subtrahend used above, hence the work is correct.

Note.—Either proof may be used. Show why these two proofs are true. Use small numbers to do this, like 7—2. Later use larger ones.

Multiplication is the method for finding the sum of a given number of repetitions of a number. Thus 12 multiplied by 5 means 12+12+12+12+12, *i. e.* 60.

The number which is multiplied is called the multiplicand, and the other number is called the multiplier. The result is called the product. The multiplier and multiplicand are called factors of the product, and the product is called a multiple of either of these factors.

The sign of multiplication is ×. Thus, 12 multiplied by 5 is written 12×5, and is read "12 times 5."

In forming the product of two numbers, it is immaterial which number is taken for the multiplier. For instance, in the product 4×5, if we make 4 the multiplier, the result is 5+5+5+5, *i.e.* 20; while, if we make 5 the multiplier, the result is 4+4+4+4+4, *i.e.* 20, as before.

It is now necessary to make a Multiplication Table, *i. e.* a list of the results of multiplying all the numbers from 1 to 12 by every number from 1 to 12.

Multiplication Table

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

The first column consists of the numbers 1 to 12. The second column is obtained by adding each number to itself, and therefore represents the result of multiplying the first column by 2. The third column is obtained by adding the second to the first, and therefore gives the result of multiplying the first column by 3. The fourth column is obtained by adding the third to the first, and so on.

Elementary Drills in Multiplication

It is absolutely necessary to know this table thoroughly in order to make any progress at all in Arithmetic. Anyone should be able to give each table forward and backward in from thirty to forty seconds. No one who cannot do this should be allowed to think that he has mastered this table:

First count by 1's; 2's; 4's and 3's.

Remember that multiplication is a short method of adding.

Explanation of methods of multiplying by one or more figures.

EXAMPLE 1: Multiply 4507 by 6.

Here we have to find the result of repeating the number 4507 six times and adding. We first take six times the units' figure, then six times the tens' figure, then six times the hundreds, then six times the thousands, and add the results together. The process is abbreviated thus:

4507	Say, mentally,
6	six 7's, 42, carry 4,
	six 0's, 0, and 4,
27042 *Ans.*	six 5's, 30, carry 3,
	six 4's, 24 and 3, 27.

EXAMPLE 2: Multiply 5287 by 578.

Here we find 500 times 5287, 70 times 5287, and 8 times 5287, and add the results.

Thus:

5287	EXPLANATION.—Place the multiplier
578	so that its unit's figure comes under the
	unit's figure of the multiplicand. By
*26435	exactly the same process as in Example 1,
*37009	we find that 5 times 5287 = 26435.
42296	Therefore 500 times 5287 = 2643500
	(since each digit now has 100 times its
3055886 *Ans.*	former value). Next we find 7 times
	5287 = 37009, and therefore 70 times 5287
	= 370090. Finally, 8 times 5287 = 42296.

*Note that it is unnecessary to affix the ciphers in the separate products, since the position of each digit indicates its value. Obviously we have only to place the first figure of each product immediately under the multiplying digit.

MULTIPLICATION BY FACTORS

If the multiplier has factors, we may, instead of using the above process, multiply by one factor, then multiply this product by another factor, and so on, till we have used all the factors.

EXAMPLE: Multiply 72486 by 147.

147 = 3 × 7 × 7.

Then

72486
3
217458
7
1522206
7
10655442 *Ans.*

Suppose the several numbers to be subtracted

(Continued on page 1259)

CHART I.

	1× 1=			1
♦	2× 1=			2
♦	3× 1=			3
♦	4× 1=			4
♦	5× 1=			5
	6× 1=			6
	7× 1=			7
	8× 1=			8
♦	9× 1=			9
♦	10× 1=		1	0
♦	11× 1=		1	1
	12× 1=		1	2

+	1× 2=			2
	2× 2=			4
♦	3× 2=			6
♦	4× 2=			8
♦	5× 2=		1	0
	6× 2=		1	2
	7× 2=		1	4
	8× 2=		1	6
♦	9× 2=		1	8
♦	10× 2=		2	0
♦	11× 2=		2	2
	12× 2=		2	4

+	1× 4=			4
+	2× 4=			8
	3× 4=		1	2
	4× 4=		1	6
♦	5× 4=		2	0
	6× 4=		2	4
	7× 4=		2	8
	8× 4=		3	2
♦	9× 4=		3	6
♦	10× 4=		4	0
♦	11× 4=		4	4
	12× 4=		4	8

+	1× 3=			3
+	2× 3=			6
	3× 3=			9
+	4× 3=		1	2
♦	5× 3=		1	5
	6× 3=		1	8
	7× 3=		2	1
	8× 3=		2	4
♦	9× 3=		2	7
♦	10× 3=		3	0
♦	11× 3=		3	3
	12× 3=		3	6

♦Signifies new numbers found in other tables of Charts I and II.

+Signifies old numbers having been studied in other tables of Charts I and II.

CHART II.

Thoroughly develop the idea of units, tens and hundreds columns. Again master each table separately and review as suggested by drill charts before beginning a new table.

1st.—Suggest that the 10 is made of a cipher in its units number and a 1 in its tens number. Also that the units number in the answer is a cipher, and that the 10's or 10's and 100's numbers are the same as the numbers we multiply by 10.

Remember that multiplying by 10 is the same as multiplying by 1 and adding an 0 to the units column.

This idea may be developed into rapid drills of multiplying by 10's; 100's; 1000's; etc., by adding 0's.

The 2's, 4's, and 3's can be reviewed by multiplying by 20, 40, and 30; or by 200, 400, and 300, etc., by adding 0's.

2nd.—Note that the 11 is composed of 2 ones; and that in the answer, both the units and tens columns contain the same numbers, as 11, 22, etc. The black line separates numbers not belonging to the rule (10×11) = (11×10; **only two combinations remain to be studied.

+	1×10=		1	0
+	2×10=		2	0
+	3×10=		3	0
+	4×10=		4	0
♦	5×10=		5	0
	6×10=		6	0
	7×10=		7	0
	8×10=		8	0
♦	9×10=		9	0
	10×10=	1	0	0
♦	11×10=	1	1	0
	12×10=	1	2	0

+	1×11=		1	1
+	2×11=		2	2
+	3×11=		3	3
+	4×11=		4	4
♦	5×11=		5	5
	6×11=		6	6
	7×11=		7	7
	8×11=		8	8
♦	9×11=		9	9
+	10×11=	1	1	0
	11×11=	1	2	1
	12×11=	1	3	2

+	2× 5=		1	0
+	4× 5=		2	0
	6× 5=		3	0
	8× 5=		4	0
+	10× 5=		5	0
	12× 5=		6	0
+	1× 5=			5
+	3× 5=		1	5
	5× 5=		2	5
	7× 5=		3	5
♦	9× 5=		4	5
+	11× 5=		5	5

+	1× 9=			9
+	2× 9=		1	8
+	3× 9=		2	7
+	4× 9=		3	6
+	5× 9=		4	5
	6× 9=		5	4
	7× 9=		6	3
	8× 9=		7	2
	9× 9=		8	1
+	10× 9=		9	0
+	11× 9=		9	9
	12× 9=	1	0	8

	6× 6=		3	6
	7× 6=		4	2
	8× 6=		4	8
	12× 6=		7	2
	7× 7=		4	9

	8× 7=		5	6
	12× 7=		8	4
	8× 8=		6	4
	12× 8=		9	6
	12×12=	1	4	4

CHART III.

The six tables containing the most difficult numbers are arranged vertically instead of horizontally, so that the child may become accustomed to the difference in the position of numbers.

	3	1	3	2	3	3	4	3	5	3	6
	×1	3	2	3	3	4	3	5	3	6	3
3	7	3	8	3	9	3	10	3	11	3	12
7	3	8	3	9	3	10	3	11	3	12	3
	4	1	4	2	4	3	4	4	5	4	6
	1	4	2	4	3	4	4	5	4	6	4
4	7	4	8	4	9	4	10	4	11	4	12
7	4	8	4	9	4	10	4	11	4	12	4
	6	1	6	2	6	3	6	4	6	5	6
	1	6	2	6	3	6	4	6	5	6	6
6	7	6	8	6	9	6	10	6	11	6	12
7	6	8	6	9	6	10	6	11	6	12	6
	7	1	7	2	7	3	7	4	7	5	7
	1	7	2	7	3	7	4	7	5	7	6
6	7	7	8	7	9	7	10	7	11	7	12
7	7	8	7	9	7	10	7	11	7	12	7
	8	1	8	2	8	3	8	4	8	5	8
	1	8	2	8	3	8	4	8	5	8	6
6	8	7	8	8	9	8	10	8	11	8	12
8	7	8	8	9	8	10	8	11	8	12	8
	12	1	12	2	12	3	12	4	12	5	12
	1	12	2	12	3	12	4	12	5	12	6
6	12	7	12	8	12	9	12	10	12	11	12
12	7	12	8	12	9	12	10	12	11	12	12

are equal to one another; suppose, for instance, we have to take away 3 times 10875 from 50171.

The work is written thus:

50171	Say, mentally,	
———	three 5's, 15,	and 6 = 21, carry 2,
10875	three 7's, 21, 23,	and 4 = 27, carry 2,
3	three 8's, 24, 26,	and 5 = 31, carry 3,
———	three 0's, 0, 3,	and 7 = 10 carry 1,
17546 *Ans.*	three 1's, 3, 4,	and 1 = 5.

SHORT CUTS IN MULTIPLICATION

To multiply any number by 25, add two ciphers, and divide the number by 4.

To multiply any number by 125, add three ciphers, and divide the number by 8.

To multiply a number by any number of nines, add as many ciphers to the number as there are nines, and from this subtract the original number.

To multiply any number by $2^1/_2$, add one cipher, and divide by 4.

To multiply any number by $3^1/_3$, add one cipher, and divide by 3.

To multiply by $33^1/_3$, add two ciphers, and divide by 3.

To multiply any number by $1^3/_7$, add one cipher, and divide by 7.

To multiply by $16^2/_3$, add two ciphers, and divide by 6.

To multiply by $14^2/_7$, add two ciphers, and divide by 7.

To multiply by 875, add three ciphers, and divide by 8.

To divide by 25, multiply by 4, and cut off two figures.

To divide by 125, multiply by 8, and cuff off three figures.

To multiply by $12^1/_2$, add two ciphers, and divide by 8.

To divide by $12^1/_2$, multiply by 8, and cut off two figures.

To find the value of any number of articles at 75 cents each, say 248 yards of cloth at 75 cents a yard, deduct one-quarter of 248 from it, and call the remainder dollars. At a dollar a yard the result would be \$248; then at 75 cents it must be \$248 − (¼ of 248) = \$184.

PROOFS IN MULTIPLICATION

THE MULTIPLICATION	THE PROOF
42	25
×25	×42
210	50
84	100
1050	1050
123	475
×475	×123
615	1425
861	950
492	475
58425	58425

The proof consists merely in reversing the positions of the multiplicand and multiplier, and performing the multiplication in the usual way. If the product is the same in both cases the work is correct.

Division is the method for finding how many times one given number can be subtracted from another given number.

The first number is called the divisor, the second number is called the dividend, and the number of times the subtraction is done is called the quotient. The number which remains after the last subtraction (if any does remain) is called the remainder.

The sign ÷ written between two numbers denotes that the first is to be divided by the second.

Division is also denoted by writing the dividend above the divisor with a line between them.

Thus $28 \div 7$ and $\frac{28}{7}$ each mean that 28 is to be divided by 7.

Division may be looked upon in two ways. Suppose we have to divide 28 marbles amongst a certain number of boys. Then (1) if we are told the number of boys we can find how many marbles each will get. (2) If we are told how many marbles each boy is to have, we can find how many boys will get a share.

It is plain from the definition of division that—

divisor × quotient + remainder = dividend.

The multiplication table enables us to divide any given number by a number less than 13.

EXAMPLE 1: Divide 3729 by 7.

We have to divide 3 thousands 7 hundreds 2 tens 9 units by 7. We cannot divide the 3 by 7, since 3 is less than 7. But these 3 thousands are equal to 30 hundreds, which, with the 7, make 37 hundreds; 37 hundreds ÷ 7 gives 5 hundreds for quotient, and 2 hundreds remainder. Calling these 2 hundreds 20 tens, and adding the 2 tens of the given number, we get 22 tens to divide by 7. This gives 3 tens for quotient and 1 ten remainder. The 1 ten is 10 units, which, with the 9 units of the given number, make 19 units. 19 units ÷ 7 gives 2 units quotient, and 5 units remainder.

Thus the whole quotient consists of 5 hundreds 3 tens 2 units, *i.e.* 532, and the remainder is 5.

The work is written thus:

```
7)3729                Say, mentally,
  ----                  seven 5's, 35, and 2, 37, carry 2,
  532 quotient          seven 3's, 21, and 1, 22, carry 1,
  ------------          seven 2's, 14, and 5, 19.
     +5 rem. Ans.
```

EXAMPLE 2: Divide 13,188 by 12.

```
                Thus:
12)13188          twelve 1's, 12, and 1, 13, carry 1
  -----           twelve 0's, 0, and 11, carry 11,
  1099 quotient   twelve 9's, 108, and 10, 118, carry 10,
  -------------   twelve 9's, 108.
```

The above process is called Short Division.

Division by 10, 100, etc.

Suppose we have to divide 1297 by 10. Now 1297 = 129 tens + 7. ∴ 1297 ÷ 10 = 129 quotient +7 rem. Therefore, to divide a number by 10, we have only to cut off the unit's figure, this unit's figure becoming the remainder.

Similarly, to divide by 100, we must cut off two figures. Thus, 1297 ÷ 100 = 12 quotient +97 remainder.

LONG DIVISION.—If the divisor is greater than 12, the quotient is usually found by the process known as long division.

EXAMPLE: Divide 39576 by 31.

```
31)39576(1276 quotient
   ----  ---------------
    85
    ---
    237
    ---
    206
    ---
    20 rem.
```

It is usual to put the dividend between brackets, turned outwards, and to write the divisor in front of it. Now, 31 cannot be divided into 3 ten-thousands so there will be no ten-thousands in the quotient. But 3 ten-thousands = 30 thousands, which, with the 9 thousands of the dividend, make 39 thousands. 31, divided into this, gives 1 thousand quotient. We write 1 (thousand) in the quotient, multiply the divisor by 1 000—*i.e.* multiply by 1, but begin writing under the thousands place of the dividend—and subtract the result from the dividend. These two operations can be done in one process, as previously shown.

The remainder is 8 (thousands). Writing the 5 (hundreds) of the dividend with the 8 (thousands) we get 85 (hundreds). 85 divided by 31 gives 2 (hundreds) for quotient. Write 2 (hundreds) in the quotient, multiply the divisor by 2 and subtract the product from 85.

The remainder is 23 (hundreds). Proceeding as before we see that 237 (tens) divided by 31 gives 7 (tens) quotient, and after multiplying the divisor by 7 and subtracting, we get 20 (tens) remainder. Bring down the 6 (units) from the dividend, making 206 (units) in all; divide by 31 which gives 6 (units) quotient, and leaves remainder 20 (units).

The complete quotient is therefore 1276, and the remainder 20.

THE THREE DIFFICULTIES IN LONG DIVISION

1. When the partial dividend contains one more figure than the divisor.

EXPLANATION: Divide the first or the first two figures on the left of the partial dividend by the left-hand figure of the divisor, and so continue.

2. When the trial quotient figure is not the true quotient figure.

EXPLANATION: (a) When the remainder is smaller that the divisor, the trial quotient figure is the true quotient figure.

(b) If the remainder is larger than the divisor, the trial quotient figure is too small.

(c) If it is impossible to subtract, because the number to be subtracted is too large, the trial quotient figure is too large.

3. When the quotient contains 0's.

EXPLANATION: Everything proceeds all right until after the first subtraction. There is no remainder. Bring down the 9 but the child sees that 48 is not contained in it even once. Tell the child to write a 0 in the quotient to show that the divisor is contained no times, and then bring down an additional figure.

If after bringing down the additional figure, the divisor still remains larger than the partial dividend, write another 0 in the quotient and bring down another figure.

PROOFS IN DIVISION

The best way to prove work in division is to multiply the quotient by the divisor and add the remainder, if there is one.

The result will equal the dividend if the work is correct.

EXAMPLE:

Divide 600,181 by 937.

WORK	PROOF
501	640
640	937
937	
	4480
937)600181	1920
5622	5760
3798	599680
3748	501
501	600181

SHORT-CUTS IN DIVISION

SHORT DIVISION.—When the divisor is a single figure, the quotient is written below the dividend, and the process of multiplication and subtraction performed mentally.

WORK:
6)845
140+5
Ans. $140\frac{5}{6}$

Divide 845 by 6. Say, 6 in 8, 1 time, 2 over; mentally prefix the 2 to 4, thus making 24, which contains the divisor 4 times. As 6 is not contained in 5, write a 0 in the quotient and consider the 5 as a remainder.

When the divisor is, 10, 100, 1000, etc., cut off from the right of the dividend as many figures as there are ciphers in the divisor.

Divide 3425 by 100. *Ans.* 34.25. 34 is the quotient; 25 the remainder.

When there are ciphers on the right of the divisor, cut off the ciphers from the divisor, and as many figures from the right of the dividend. Divide remaining part of the dividend by that of the divisor. Annex the figures cut off from the dividend to the remainder, for complete remainder.

At a yearly salary of $1500, how long will it take to earn $9375?

WORK:
15|00)93|75(6¼
90
375
$\frac{375}{1500}=\frac{1}{4}$.
Ans. 6¼ years.

The remainder, 3 (hundred), and the 75 cut off, form the complete remainder, or $\frac{375}{1500}$, reduced, equals ¼. The figures cut off are the complete remainder when no other.

PROPERTIES OF NUMBERS AND CANCELLATION

An Integer or Integral Number is a whole number; as 1, 7, 25, etc.

A Factor or Exact Divisor of a number will divide it without a remainder.

EXAMPLE: The factors of 9 are 3 and 3, because $3\times3=9$.

A Prime Number is one that cannot be resolved into factors.

EXAMPLES: The Prime Numbers below 50 are 1, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47.

All Prime Numbers, except 2 and 5, end with 1, 3, 7 or 9.

PRIME NUMBERS FROM 1 TO 1000
(Use This Table for Reference)

1	97	227	367	509	661	829
2	101	229	373	521	673	839
3	103	233	379	523	677	853
5	107	239	383	541	683	857
7	109	241	389	547	691	859
11	113	251	397	557	701	863
13	127	257	401	563	709	877
17	131	263	409	569	719	881
19	137	269	419	571	727	883
23	139	271	421	577	733	887
29	149	277	431	587	739	907
31	151	281	433	593	743	911
37	157	283	439	599	751	919
41	163	293	443	601	757	929
43	167	307	449	607	761	937
47	173	311	457	613	769	941
53	179	313	461	617	773	947
59	181	317	463	619	787	953
61	191	331	467	631	797	967
67	193	337	479	641	809	971
71	197	347	487	643	811	977
73	199	349	491	647	821	983
79	211	353	499	653	823	991
83	223	359	503	659	827	997
89						

A Composite Number is one that is composed of two or more factors; thus, 4 and 30 are composite numbers, because $2\times2=4$; and $2\times3\times5=30$.

A Multiple of a number will contain it without a remainder.

The Aliquot Parts of a number, are the parts by which it can be divided without a remainder; thus, $6\frac{1}{4}$, 10, $12\frac{1}{2}$, $16\frac{2}{3}$, etc., are aliquot parts of 100.

The Reciprocal of a number is the quotient arising from dividing 1 by that number; thus, the reciprocal of 2 is ½; of 8, ⅛; of 25, $\frac{1}{25}$, etc.

The Arithmetical Complement of a number is the difference between itself and the next higher decimal; thus, the arithmetical complement of 7 is 3; of 85, 15, etc.

Factoring is the process of resolving a composite number into its factors.

A Prime Factor of a number is a prime number that will exactly divide it; thus, the prime factors of 42 are 2, 3 and 7.

A Common Factor or Divisor of two or more numbers will divide each of them without a remainder; thus, 6 is a common factor of 18, 24 and 30.

Two or more numbers are prime to each other when they have no common divisor; thus 9 and 20 are prime to each other.

To find the prime factors of a composite number.

RULE.—Divide the number and each successive quotient by their least prime factors, till a quotient is found which is itself a prime number.

EXAMPLE:—Find the prime factors of 105.

WORK:

3)105
5)35
7

The least prime number that divides 105 is 3, and the least that divides 35 is 5; hence, the two divisors and 7, the last quotient, which is itself a prime number, are the prime factors of 105.

Ans. 3, 5, 7.

GREATEST COMMON DIVISOR

To find the Greatest Common Divisor of two or more numbers.

RULE.—Divide, first the numbers, then the quotients, by any common divisor. The product of the several divisors will be the greatest common divisor.

EXAMPLE: Find the greatest common divisor of 12, 30 and 54.

WORK:

2)12 30 54
3)6 15 27
2 5 9

Writing the numbers in a line we find that 2 is a common divisor of all the numbers, and 3, of all the quotients. The last quotients (2, 5 and 9) being prime to each other, proves that 2 and 3 are the only common divisors, and that 6, their product, is the greatest common divisor of 12, 30 and 54.

Ans. 6.

Another method of finding the greatest common divisor—by continued divisions.

EXAMPLE: Find the greatest common divisor of 65 and 91.

WORK:

65)91(1
65
26)65(2
52
13)26(2

RULE.—Divide the greater number by the smaller; then the divisor by the remainder, and so on, always dividing the last divisor by the last remainder, till nothing remains. The last divisor is the greatest common divisor.

Ans. 13.

THE LEAST COMMON MULTIPLE

of two or more numbers is the least number that will contain each of them without a remainder; thus, 36 is a common multiple of 2, 3, 4 and 6; while 12 is their least common multiple.

To find the least common multiple of two or more numbers.

RULE.—Write the numbers in a line, and divide by the least prime number that will exactly divide two or more of them. Write the quotients and the undivided numbers in a line below. Continue to divide in this manner till the numbers in the last line are prime to each other. The continued product of the divisors and the numbers in the last line will be the least common multiple.

EXAMPLE: Find the least common multiple of 2, 3, 4, 5, and 6.

WORK:

2)2 3 4 5 6
3)1 3 2 5 3
1 2 5 1

Writing the numbers in a line, we see that 2 will exactly divide three of them; so we write the quotients and the undivided numbers in a line below. Again, we see that 3 will divide two of the numbers in the second line. The numbers in the third line being prime to each other, we multiply them and the two divisors together; thus, $2\times3\times2\times5=60$, which is the least common multiple of 2, 3, 4, 5 and 6.

Ans. 60.

CANCELLATION

Cancellation is the striking out of factors common to dividend and divisor. It is proper whenever only the ratio of the quantities is to be considered.

If the dividend and divisor both have common factors, the work can be made much easier by cancellation.

In order to cancel, write the dividend above the divisor, with a line between.

PRINCIPLE.—Canceling like factors from both dividend and divisor does not change the quotient, but makes the work easier.

EXAMPLE:

$$18\div9=2$$

Cancelling the factor 3 from both 18 and 9, we have—

$6\div3.$

$6\div3=2.$ The quotient is not changed.

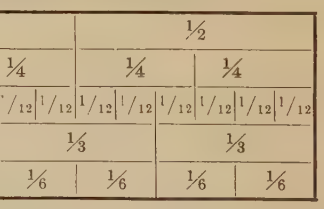
ANOTHER FORM

$$\frac{18}{9}=2$$

Cancelling the factor 3 from both 18 and 9, we have—

$$\frac{\overset{6}{\cancel{18}}}{\underset{3}{\cancel{9}}}=\frac{6}{3}=2$$

Note.—In cancellation we use the last form.



The above diagram shows the relation of the elementary fractions to one another, and from this point on the pupil should be taught to think in terms *less* than a unit.

(The more advanced treatment of arithmetic begins on page 850.)

CONDUCT AND MANNERS OF CHILDREN: To Parents and Teachers

"A king can do no wrong," it is said. You might well add, though for a different reason, "nor children either." This conception of child nature should determine, in large part, the fundamental attitude in the home.

The child may be *doing* what is *wrong;* but you should remember that he is not doing it *because* it is wrong. In the first period you should consider more especially the necessity of his forming *good habits*, for habit at this time really takes the place of *reasoning* on his part.

Difficult as such an attitude may appear, it is possible for you to acquire it in time if you strive to allow no exception to the assumption that young children are innocent, that is, that *they really do not mean to do wrong.*

In your soul there should not be one drop of anger, indignation, or condemnation.

The thought which should guide you is that children are pupils, and have to be *taught* how to conduct themselves precisely as they have to be taught with the greatest difficulty and the utmost perseverance their "lessons."

Parents should therefore display as much self-control and foresight as the teacher, for, broadly speaking, *their task and that of the teacher are identical.*

Home Atmosphere.—Assuming *affection* for your children as a matter of course, the home atmosphere should be one of happiness, joy, cheerfulness, geniality, and good temper.

Happiness acts on children as the sun acts on the vegetable kingdom. They can never have too much of it. They will grow best, learn best, behave best, if you keep them happy.

Do not argue with children about things. Let them know in a pleasant manner, as *you* already know, that habits cannot be acquired or removed by argument or exhortations. Following this principle, you say that you cannot hear when addressed in a loud voice; that "must" means "must not," and "must not" "must"; that "always" means "never," and "never" "always."

Importance of Postiveness.—An indefinite attitude on the part of parents is the cause of much mischief in home education.

Children may get so accustomed to hear you repeat and repeat a request that after a time they will find a genuine difficulty in grasping that they are being spoken to or asked something.

At the very beginning it is religiously necessary that you should pay close attention at the time of the action, and that you should frequently remind your children during the day of what is expected of them during meal-times, etc.; but this should almost wholly cease after four or five days.

Doing the wrong thing is frequently, in part or wholly, the result of ignorance. Accordingly you will naturally see that the children know, for instance, how to hold the spoon or fork, how to convey the food to the mouth, and how to bend over the plate in eating; and you will take great pains to *instruct them as to every detail*, not losing patience because they do not know what is expected of them, because they do not readily understand, or because they very easily forget.

It is, therefore, not too much to expect that for, say, three days your attention will be unstintingly given to the *habit to be acquired*, especially as the children have probably to learn to forget the way they have been accustomed to proceed. The building up of one habit usually means the removal of another.

Without such a rule, the tendency is for the children to retain an objectionable habit indefinitely, for months and even years. The "within a week" rule acts lightning-like and settles every one of your difficulties at once and once for all. Without it, also, bad habits pile on bad habits, and you have ceaselessly to exhort, to warn, and to reprove, with ever fewer chances of achieving any substantial changes, till you are driven nearly to despair.

Solve One Problem at a Time.—If you are to be successful, another kind of definiteness is essential, namely, *ask for one or a very few changes of a definite character at a time.*

To demand of children to "behave properly" in a week, or even to improve in half a dozen matters within this period, or for them to attempt things beyond a child's strength, is to invite failure and disappointment. Concentrate, therefore,

on building up one or two habits in a week, and leave other things to be dealt with later.

Keep a Sunny Temperament.—Habits are readily and speedily formed, and those habits are readily and speedily loved for the ideal end which they serve. Be *thoroughly cheerful* and your children will courageously bear pain, trouble, and disappointment, and good habits and desirable qualities will grow like vegetation in the tropics. In such an atmosphere the germs of moral disease languish and die.

You should *help* your children to be good. You should bring them gradually to acknowledge that they themselves desire to be true men and women, independent of the impulses and appetites of the mere moment. You should induce them to allow you to co-operate with them in their up-building. You should typify to them the *ever-constant friend* rather than the *superior parent.*

Punishment and Reproof.—You may think that under a subtle disguise *punishment* has been justified in several instances in the preceding paragraphs. But if punishment implies a wrong done, a wrong-doer, and expiation, this is not the case.

Take, however, the instance of your child having done "wrong," and that exhortation is ineffective. In that case still keep your poise, and send him into a corner or up to bed "to think" about how he is to act in future, or treat him gravely, or do not speak to him for an hour or two, and the like. Treat the case as one for the *doctor*, not for the *executioner*, and you will quickly succeed.

If, on the other hand, you lose your temper, your child will lose his temper, and the effect of the correction will be virtually zero. Once more, treat your mistaken or erring child gently and thoughtfully, precisely as a gentle and thoughtful physician treats his patients. Remember the following points:

(1) A *sunny temperament* is essential.

(2) You should feel for your children and *put yourself in their place, in order to understand them and do justice to them.* It will not do for you to think that they can teach you nothing.

(3) *You should use your wits to the uttermost*, for only in this way will you be able to discover what is the best thing to be done. Take it easy, and the child will prove more than your match.

(4) *You should have a strong, inflexible, unwavering will.* When you have made up your mind on good evidence, nothing but better evidence should be able to change it. Your children will thus not expect to move you by those little ways which children employ, and they and you will be the happier for it.

(5) You should remember that refinement or respect for the individuality and sensibilities of others is as much in place in the nursery as in the drawing room.

Only if you serve in this way the good with all your heart, all your mind, all your will, all your brightness, and all your refinement, are you likely to succeed and avoid disappointments innumerable. "Enlightened fellow-feeling promptly, genially, and tactfully obeyed" should be everybody's rule of life, especially the parents'. Let this be your motto and you will not think of punishment, while the atmosphere of the home will be all that it should be.

Habits of Orderliness.—Under regularity, or orderliness, the following habits should receive early attention:

(1) The child is to be put to bed at regular times, early, while awake, without anyone remaining with it, and without leaving a light behind in the room;

(2) it should rise at regular times, the amount of sleep being adjusted according to age;

(3) it should, health permitting, have its food and bath regularly in a regular place and in a regular manner, not playing with the food nor having food between meal-times;

(4) it should have, at least twice a day, in very nearly all weathers, outdoor exercise or outdoor air for stated periods at set times (of at least one and a half hours);

(5) by the age of two and a half it should practically eat by itself, and begin to dress and wash itself;

(6) it should not touch anything on the table, nor touch sticks, knives, forks, matches, lamps, nor any class of object not already permitted, and it should not ask for what others possess;

(7) it should always have its hands and face clean before meals, and cleanliness and tidiness should be generally encouraged;

(8) it should ask for, or use, a handkerchief;

(9) its natural wants should be, in health, satisfied at appointed and convenient intervals;

(10) it should pleasantly say "Please" and "Thank you," "Good morning" and "Good night," "How-do-you-do," and "Good-bye"; and

(11) it should gradually be brought to act on the principle: "A proper and convenient place for everything, and everything in its place."

THE DESIRABLE HABITS.—You may avoid much superfluous thought during the first and following periods by discovering what things are to be respected —say, *punctuality; promptitude; gentleness; orderliness; sobriety; purity; industry; selecting desirable companions; loving learning, nature, and art; respect; self-help; plain living; and dislike of unnecessaries; thoughtfulness*—and seeing that these are followed *unhesitatingly.*

Lastly, by making in time the *doing what is right and reasonable the supreme conscious habit,* of which the other unconscious habits are expressions, all habits lost their inelasticity.

You must remember that *we can only chose between good and bad, reasonable and unreasonable, habits, not between habits and no habits.* As your children grow older you may expect that the formation of apparently separate and meaningless habits will grow into the *single habit* of wishing to *do the right generally.*

MANAGEMENT OF THE WILL

Both in the earlier stages and in the later there are plenty of opportunities to practice this comprehensive and cardinal virtue. Here are some of the habits to be acquired in this connection, though great care must be taken that nothing unreasonable is demanded of the child, else we shall fail completely:

(1) A phrase like "I am sorry" might be chosen to indicate that a thing ought not to be done. This phrase is not to be repeated nor to be lightly used, and must be respected at once.

(2) Definite suggestions must be followed unhesitatingly.

(3) There must be no scolding or corporal punishment; the voice should be lowered rather than raised when ordering or disapproving.

(4) Requests and prohibitions should usually be uttered conversationally.

(5) Children should never be offered or receive rewards for doing what they ought to do—loving approval or pained disapproval, or moral approval and moral disapproval, should be the only additional incentives. Children follow advice naturally and cheerfully.

(6) Crying should never act as a reason for granting what had been rightly denied; this is imperative, for children as they grow older do not cry (except for a few moments, or when in pain) when they know that crying is useless.

(7) The words "Please wait" should be employed on equal terms with "I am sorry" and requests; but this class of request should not be abused. Many parents compel children to wait for protracted periods, and of course impatience, and not patience, is thus fostered. Similarly, children's requests should be attended to without undue delay; they should not be kept indefinitely waiting for an answer.

(8) Children must not be tempted to act rightly out of jealousy. When the child declines to accept anything, it should never be told, for instance, that if it does not accept it the cat will have it, or its brother, or someone else.

(9) *Teasing* should not be a method of inducing children to respect our wishes, nor should there be, except with trained children, an *appeal to the child's love* when obedience is in question, for love must be the normal state which is felt rather than known. *Ridicule* must be avoided, and so must *rough play* and *lack of refinement.*

(10) When the child requires something, its attention should not be diverted by, for instance, saying, "*Oh, look at the duck.*" Diversion should only be used during the period of infancy (say, up to eighteen months) or during illness, and then most sparingly, or else when the child evidently desires to have its mind changed, which is not infrequently the case.

A wise and firm parent will not be tempted and will not need to resort to any of the shifts censured in this class of habits. Unswerving firmness, assisted by careful thought and a genial temper, accomplishes with ease what many laborious shifts are powerless to perform. A glance of disapproval or expression of

disappointment is with the well-trained child or more weight than a thrashing with another which is badly brought up.

Regular good habits, a simple life, and a disciplined will make the task of both parent, teacher and child relatively light.

MORAL HABITS OF CHILDREN

The last class of habits to be acquired in early childhood are the more strictly *moral* habits. These are comparatively few in number at this stage. They are as follows:

(1) The child *should not be made vain* by an undue admiration of its dress, features, or possessions.

(2) Property should be mostly held in common and for use rather than be regarded as personal; "this is mine" is a phrase for which there should not be many occasions, while "this is hers," "this is ours," should be encouraged. At the same time it should be recognized that private property has many valuable aspects, and should not, therefore, be altogether discouraged.

(3) The child should gladly share with others.

(4) It should be courteous; "please" and "thank you," etc., to be normal expressions on its part.

(5) After the second year it should be helpful in many small things and love to attend to itself a good deal.

(6) It should suffer small pains bravely and make little of them. There should be no beating of chairs against which the child has fallen; no kissing the spot hurt (though there is little harm in this), but rather sending a kiss to the chair which caused the hurt. "Never mind," said cheerily, may be perhaps the most appropriate and most lasting soother of pain.

(7) The child should not beat others to the admiration of those present. Many children are thus drilled into slapping and kicking. They should have no experience of the kind to repeat.

(8) The child's gaze should be encouraged to be frank, its voice pleasant, its bearing firm.

(9) The child should learn with growing deliberateness to love and do the right, so far as this can be expected of a young child.

(10) It is advisable that the child should be encouraged in the active virtues by having a pet to care for, and that in this connection the virtues of gentleness and thoughtfulness should be strongly emphasized. With a cat as with a dog it is easy to determine when they are tired of play or do not relish it.

Best of all, but not to the exclusion of the other ways, is active assistance in the home, looking after personal matters, and helping brothers and sisters. Care of plants is also of a high educational value. Remember, however, that *all work and no play make Jack a dull boy.*

(11) Only what is thorough may pass.

(12) Everything should be done with care, whole-heartedly, and intelligently.

(13) The child should be prompted to be joyously cheerful and make light of small troubles. It should love to be *brave.*

(14) The idea of right should extend to all living beings with whom the child comes into contact.

As to habits in general, special difficulties are often experienced at certain critical stages—first, when about the age of two, the child begins to reason; secondly, when two or three years later, its will and power of speech develop; thirdly, when, about the age of ten, the child begins to be capable of self-directive action; and, later on, when adolescence merges into manhood or womanhood.

In the first stage, as in the second and third, patience and persistence are required to attach the child to reasonable habits, for in both cases it is only a question of tiding over a transitional period.

At the same time, just because we have to deal with a turning point, we must not be over-insistent; we must allow sometimes that we are mistaken or that the child is stronger than we are; we must trust, to some extent, to time; we must conquer by intelligence rather than by a measuring of wills; and we must also consider how far?

OBEDIENCE

Obedience means no more than suggesting to a child something which we desire it to agree to, and in ideal cases this is the relation between parent and child.

The baby knows no rules. It seeks only what seems pleasant to itself. It is kept only by force from doing what would be harmful to itself, or to the persons and things about it.

Soon, however, in the case of a child properly trained, the rules begin, and it never is free of them again so long as it lives.

The first lesson that the child has to learn is the general one of obedience. *It must learn to obey*, for this lies behind and beneath all other lessons.

In this the training of a child is like the training of a dog or a horse. When the animal has learned what it is *to mind* it can learn a great many other things.

This does not mean that the child must have hard and harsh rules. The best obedience is learned quietly and pleasantly, and almost without the sense of constraint. Even a dog is best trained in this way, and then it thoroughly enjoys performing its tricks.

As the child grows older, the problem of obedience changes.

You may have been surprised at being told that it is manly to obey, and that men and women have to do this. At school the scholar has to mind the teacher, and the teacher seems only to command. But the teacher has to obey as truly as the scholar. What would you think if, when you went to school, you should find that the teacher had gone off for a day's pleasuring in the woods? You might like it, but what would your parents or the committee think? What would they think if the teacher did not hear your lessons, and did not see that you learned them? Thus you see that the teacher has to obey as well as the scholar.

Fine characters are moulded chiefly through obedience in early life.

TRUTHFULNESS

Perhaps the first serious danger you will meet with in older children is that of possible untruthfulness.

Hitherto your children's minds were not developed enough to speak or act a lie; but now matters are different. Both in speech and in action your children become capable of untruthfulness in this period, and perhaps the greater danger is untruthfulness in speech. Here the starting-point is in many cases natural, since toward the beginning of this period children are usually ready to utter whatever sentence their imagination constructs.

When the child has offended, and it is interrogated as to its guilt, it at first gives indiscriminate answers; at a later stage, more especially when harsh treatment is probable, it may find that telling an untruth is convenient, and in this way proceeds on the slippery road. In most cases the process is apparent: the child, for instance, invariable and parrot-like, says that its brother did it. Supreme caution is, therefore, required here.

As we have seen, occasions for untruthfulness should be of themselves rare when the child is orderly, simple in its tastes, ready to respond, and eager to help. You should further discourage incorrect statements by

(1) correcting them as amusing slips or errors;

(2) not putting doubtful questions;

(3) ignoring what is flippantly said; and

(4) never speaking about lies and lying or falsehoods.

"You are making a mistake," "Try to look or remember more carefully," said in a highly amused tone, should be your normal comment to some exaggerated or slipshod statement. If you act intelligently, your children will soon come to think truthfully and be truthful.

EXAMPLE AND PRECEPT

Children, you doubtless know, are imitative, though you may not have noticed that they not only imitate your actions but your attitudes and feelings. It is important to recognize this, since by such imitation your children enter, for better or worse, into the whole spiritual heritage of mankind. By assuming a certain bodily attitude, we suggest the feelings appropriate to it, and if you watch your young children you will find that in this manner they enter into our ways of being gentle, angry, afraid, or affectionate, and that in the same way they imitate the weakness, waywardness, or strength of our will and thought.

Consequently it is of the utmost importance that *the tone of voice, words, gestures, look, step, bearing, and movements* should as closely as possible approach perfection.

THE ADOLESCENT PERIOD

There are some virtues which are best emphasized at this period:

A very important one is that of *unhesitatingly doing what one believes to be right and reasonable.* Most tempta-

tions would be shut out if the young were determined to consider the reasonableness of a certain class of temptation only after the temptation is overcome.

This means that the young are to decide on what general courses of conduct are right to follow, and never question these when the time for action arrives.

The leading virtue of this Period is *Truthfulness*, which, being interpreted, means "full of the love of truth."

If this virtue distinguishes your children:

(1) they will hide nothing from you;

(2) they will be guilty of no mean or low action;

(3) they will avoid evil companionship;

(4) they will take part in no intrigue; and

(5) they will be honest with themselves and honest towards others.

Their relations with their fellows will at least be blameless so far as deceit of any type is in question, whether towards parents, friends, or those of the opposite sex.

And we can have no doubt that the other master virtues of the period are *love of purity, of sobriety, of work, of worthy companions.*

Perfect purity in thought, word, and deed; complete sobriety, that is, total abstinence from all intoxicating liquors; hearty love of work, that is, learning at school and choosing and following a profession enthusiastically; and good companions, that is, companionship which both satisfies and ennobles—are sure to be the gainers by *truthfulness.*

Parental Confidence.—A neighboring virtue is that of *trustfulness towards parents.* This latter virtue is of critical importance during adolescence. Let your adolescent child never embark on anything grave without consulting you, and you have a means of assisting sexual purity far greater than any indirect methods could offer. A truthful and trustful adolescent will be chivalrous, and scorn anything that requires an untruth or needs to be hidden from you.

As your children approach to *manhood* and *womanhood*—the flower of the virtues—*refinement*, must reveal itself in its full beauty—subtle insight into the needs, ideas, and feelings of others, and delicate sympathy with others' states of mind.

The Adolescent Problem.—The following outline for the consideration of parents may prove useful:

1. *The Problem:* consider carefully the whole meaning of adolescence and of marriage in its various aspects.

2. *Habits to be generally promoted:* simple and hygienic living, daily cold baths, abstinence from stimulants, sufficient exercise, hard work but not overwork, respect for self and others, sound and not too much sleep, not too soft a bed, rising instantly on waking, not drinking in the evening, etc.

3. If the adolescent teaching is *to be effective it must form part of a general system of moral teaching*, for then the force of the whole teaching can be brought to bear on the subject. In this way the adolescence problem is indirectly solved and settled.

(*a*) Take care, from the earliest period, that the child knows the devotion of the parents to each other and to their children—the common cares and joys—mother managing the household and father earning the money for the household; nobility and responsibility of married life; the parents as ideal and permanent companions; marriage not to be lightly undertaken; the home as the unit of the State. The central thought in this teaching from about the time of puberty to the approach of manhood must be a high conception of courtship and marriage, thus minimizing the merely physical aspect, and identifying the satisfaction of the race instinct with the preservation of the race through the married state.

(*b*) As early as possible answer the child's questions about child-bearing and birth, its pains and joys;

(*c*) Prepare for (*b*) and (*d*) by a study of botany and some physiology.

(*d*) Stage of Adolescence: Explain the general unrest as due to physiological changes; explain that these will end in manhood, inclusive probably of marriage; point to the manliness of self-control; the general impulsiveness of this period to be understood and controlled; self-control in the light of the full meaning of marriage; self-control as essential to the healthy and proper growth of the adolescent; this control not harmful to adults, and practiced often in married life; bringing a pure and healthy body

to one's partner in marriage; what the adolescent, in thinking of his own married life, would like his children to be in matters of purity; the effects of being in the grip of a vile habit; the race instinct to be evidently satisfied only in the married state when parents feel that they ought to have children or when in that state no harm is done; evil companions and habits are an insult to our parents and to our ideal of marriage. Develop these ideas as the adolescent grows to manhood.

(*e*) Prostitution in the light of the whole meaning of marriage: its support is unmanly, below the conduct of a great many animals; argues a weak character; to give way to instincts is no sign of nobility; drags our whole moral nature into the mud; is an insult to our mothers and sisters.

4. The physical aspect of marriage is but a very small portion of the whole of marriage; therefore give it no special prominence.

The above outline is drawn up for the purpose of protecting and promoting *personal purity*, which is not usually sufficiently emphasized, and it *applies equally to girls and boys*.

5. *The parents should be the most intimate friends of their children, and their children should always consult them, and them alone, about the most intimate matters.*

Two final virtues round up the scheme of moral education for children. The natural love of strenuousness in childhood and youth should take form in the *desire for earning one's own livelihood* and acting in our vocations honestly and efficiently, while the love of being helpful should blossom forth at the end of the period in *an intelligent and devoted citizenship, which has for its ultimate object the harmony and advance of the human race.*

CHILDREN'S MANNERS

Their Speech.—Good manners, as well as charity, should begin at home; and even in the nursery. Boys and girls cannot be too early taught not to contradict one another, but in expressing any difference of opinion to begin with some polite phrase, as, *I beg your pardon, but*, or, *I think you are wrong*, etc. None but an untrained child will venture to correct or gainsay an elder even in this courteous fashion unless asked to give his or her knowledge or opinion of the matter under discussion.

In the presence of strangers or older persons, a polite little man or maid would forbear to speak until an opportunity was offered by a pause, or to assist in the conversation unless asked to do so. *Yes, no, I thank you, I am not sure, perhaps, I hope so*, as answers to questions, are eminently proper when a child speaks to one of its own age. For older persons, *Yes, ma'am*, and *No, sir*, imply the respect exacted from and paid by a servant to his or her employer.

For children the need of deference due their seniors is amply, and in well-bred families invariably, expressed by affixing to the reply the name or title of the person addressed, thus: *Yes, mother; No, papa; Thank you, Aunt Mary; I am not sure, Mrs. Brown; I hope so, Doctor Jones.*

Greeting Friends and Strangers.—On introduction to an older person, recognition should come first from the adult, as well as the offer to kiss or shake hands. *How do you do, Mrs. Brown;* or *Good morning, Mr. Jones*, is sufficient expression of greeting from the young person; and he further displays good taste and modesty by permitting the lady or gentleman addressed to begin the conversation and to end it.

On entering a room where her mother is entertaining a guest, a little girl stands beside the mother's chair until an introduction is made; and if a favor or question is to be asked, she should politely request permission to ask it; and she should remember to give the caller a polite good-day on retiring.

A boy would observe exactly the same rule. And in the street, when walking with his parents or sisters, he should lift his cap when they answer a bow or meet a friend. A boy can hardly learn too early that he should stand when the ladies enter a room, and open the door for his mother and older sisters.

THE SHY OR UNTRAINED CHILD

A shy child or an impertinently forward one should not be corrected in public by the parent who is too indifferent to strive for reformation of his or her shortcomings in private. An untrained child will contradict its mother promptly and impertinently abroad, if

allowed to do so at home; it will openly stare or laugh at an unhappy deformity, frankly comment on a visitor's loss of an arm or redness of nose, and will accept remonstrance with bad grace, if only in the presence of strangers any restraint is put upon its often innocent or unkind observations.

There is really no difficulty at all presented by the condition so often miscalled "shyness" in a child. Few children are naturally shy. Self-consciousness, an excess of vanity, a sullen humor, or a timidity engendered by a genuine unhappy ignorance of what to do, are too often the true causes of the ill behavior for which mothers too readily offer excuses. No well-mannered child is ever too shy to speak when spoken to or to play its modest little social role.

Now and then a boy or girl of a nervous temperament and lacking wholly in self-confidence betrays a case of shyness pure and simple. This a sensible mother can do much to overcome by herself rehearsing with the youngster many forms of entering a room, answering kind greetings, etc.

Children's Entertainments.—The afternoon nursery party has its duties, self-sacrifices, pretty courtesies and demands upon juvenile tact, no less than the more splendid social affairs. Even in the playground it is important for the youthful host and hostess to understand the obligation resting on them to sacrifice their own pleasure for that of any guest and play those games the visitor prefers; and on the occasion of a birthday dance or more elaborate celebration, it is not correct for the entertainers to be the most elegantly dressed of the merry-makers.

Childrens' Invitation.—On small, prettily decorated note sheets or cards, invitations to a child's party may be written, under the mother's guidance, by her children, and either posted or delivered by hand. Engraved invitations are not to be recommended for children's entertainments.

Children on being invited to a party must answer their invitations promptly, writing the replies themselves, either in the third or first person, according as the bidding to the festivity was worded.

Time and Arrangement for Parties.—From four to seven o'clock is the proper time for holding a dance for young children; and from seven to ten or eleven, for those under sixteen and over ten years of age.

A piano or a piano and harp will provide all the necessary music. Flowers may be used in abundance; and ices, cakes, fruits, salads and sandwiches are served from the dining-room table as a buffet. A bowl of lemonade stands constantly ready by the parlor door, and dance programmes are provided.

In summer, an afternoon entertainment is best held out on the lawn, and as twilight comes on, paper lanterns used. Some older person should aid the children in receiving the little people, and impress on the small host or hostess that the most important duty of the occasion is to see that the guests have a good time; that in the diversions there is no injustice done; that no girl or boy is overlooked during the dancing; and that everybody is served at the table.

Children House Guests.—Should a child be entertaining a guest when invited to a merry-making, he or she is privileged to write to, or call at once on, the giver of the dance or picnic to ask permission to bring the visitor along. And when arriving for the entertainment, he or she introduces the friend or relative to the matron of the occasion by simply saying: *Mrs. Brown, here is Mary Sherman, whom you were so kind as to say I might bring.*

Birthdays.—If the party is in honor of a birthday, congratulations, in the form: *I wish you many happy returns of the day*, are in order from the guests to the young host or hostess. On preparing to leave, every child should seek out the mistress of the house first, and say with a bow: *Mrs. Brown, I have enjoyed the dance very much and have come to bid you good evening, or Good night, Mrs. Brown. I thank you many times for my delightful evening.* Unless Mrs. Brown offers her hand or a kiss to her little guest, the bow and polite farewell are enough. With the younger host or hostess less formality is necessary, but it is requisite to seek him or her out and say cordially, *Good-bye, Bob [or Mary]; I have had a very pleasant time indeed.*

Children's Playmates.—A most important branch of etiquette for a mother to study is that which has to do with the

pleasure, comfort and protection of her children.

It is a species of nursery and back-yard diplomacy that children themselves don't understand, and of which the average woman is only too ignorant; but it has everything to do with maintaining her her own station and good name in her neighborhood, or town, or street. Its first mission is to regulate and control the children's list of visiting and playing acquaintances, for small boys and girls are scarcely expected to show much discretion in their choice of friends.

When neighboring children conceive a liking for one another and their parents are unacquainted, the latter should be at pains to learn something of the home influence and surrounding of the companions of their boys and girls. If in such a case a party is in contemplation, and the son or daughter of Mrs. B. wished to extend an invitation to the children of Mrs. A., it is safest and most polite for Mrs. B. to write a courteous note to Mrs. A. seconding the invitation offered by her child. If Mrs. A. responds cordially, nothing more is needed to assure Mrs. B. that the youthful guests come to her house with full parental consent.

Undesirable Playmates.—Not infrequently a woman finds that the children of some friend of hers are spoiled, vicious, or vulgar, and therefore impossible playmates for her own well-reared children. Then the heroism of a good mother exhibits itself. She cannot in justice exclude the children of her friend from her house and acquaintance unless the friend goes too; but it is better to lose many friends than to expose the pliable, easily swayed young minds of her boys and girls to a single evil influence.

The Tactless Child.—When an entirely acceptable but tactless little boy or girl becomes too frequent a visitor at a neighbor's house, or fails from a lack of sensibility or training to know when to call and when to take leave, a rather difficult duty devolves on the mistress of the house. Shall she tell the too persistent young visitor that it is late and suggest his returning home, or meet him at the door and deny his company to that of her boys and girls? If she is a wise woman, neither of these courses will be followed.

The proper method for her when a boy visitor appears too often, is to send her own son forth with the perfectly polite request that the caller excuse him as he has tasks or errands to perform for his mother. She should be sure, though, that her son's excuse is a genuine one, and that his apologies are made kindly.

In the event of a child visitor lingering too long in the evening or at meal time, she can very properly say that she fears the young caller has forgotten that his mother may be anxious and that for that reason she may not allow her children to ask him to stop for dinner or to spend the night.

A very little child was one day listening to a story about "A lazy boy who missed a school picnic because he was so slow in getting ready. The school children were all on board the steamer, the bell rang, the moorings were loosed, and away went the boat just as the late little boy came running down to the pier."

The little listener followed the story intently up to this point, and then burst out, "Oh! Auntie, couldn't they get a little row-boat and take him out to the steamer? I don't like him to be left behind."

Stories, then, enlist the sympathy of the child.

Third.—Story-telling strengthens the child's power of imagination. But, be careful to develop the imagination in a right direction, and not to feed it with anything coarse or cruel.

Fourth.—The stories offer opportunity for inculcating moral truths and sometimes it is possible to teach by stories truths that would be difficult to teach in any other way.

Kinds of Stories.—(*a*) *Stories of Real Life*—of events which have actually happened, or would be likely to happen. It is in this kind of story that moral truths can be illustrated most frequently.

(*b*) *Fairy Tales.*—Some people object to fairy tales, but innocent fairy tales feed the imagination, and often point a moral. Stories of horror and cruelty should never be recounted. Children soon learn to take delight in this class of story, and as a consequence, their moral tone deteriorates. Such stories as "Bluebeard" have this effect, but "Cinderella," "Sleeping Beauty," and many others, show that right is victorious in the end, and cannot have any bad effect on the children.

(*c*) *Stories of Nature.*—Flowers, rocks, trees, and other objects in nature may be made the subject of pleasant stories, interesting as a fairy tale, and many important truths may be taught in this way. A story of the kind is given as an example.

(*d*) *Stories for Very Little Ones.*—These should be exceedingly simple. A dog, a kitten, a bird, anything that comes into the life of a little child, he is delighted to hear about. Many such stories are given in the chapters on Numbers and Reading, and others will suggest themselves to the teacher. They should all be told in baby language, *i.e.*, in language that the child can comprehend. Pictures often suggest a story, which is all the more interesting for being thus illustrated.

The children should sometimes be encouraged to tell what they can remember of the story. In this way they learn to express themselves.

The Story-Teller. (*a*) We have said before that the language should be simple and easy to understand.

(*b*) The voice should be modulated, and the story-telling is much more effective when gesticulations are used. The flying of birds, the rustling of leaves, etc., should be accompanied by hand movements on the part of the Teacher.

(*c*) The story-teller should be in sympathy with the subject of the story, and also with the listeners, otherwise the interest will be lost.

(*d*) Just as pictures add interest to a story, so do illustrations on the blackboard, and these should be frequently given. Sometimes the children may be allowed to draw for themselves objects which have been mentioned in the story.

The After-Effect of Stories.—It is well to remember that the child's taste for reading is largely influenced by the class of stories told to him in early life, and in these days of plentiful, cheap literature, how important it is that the youthful mind should be trained to appreciate that which is good.

If a child has learned to gloat over horrible stories, he will gratify this morbid taste by reading ghastly tales as he grows older, and if, on the other hand, he has learned to love stories that are simple and pure, he will choose reading that is good and elevating.

INDEX

The intelligent use of an *index* requires careful thought and practice upon the part of the reader or consulter. Many books are *over*-indexed, and trifling *allusions*, or even *words*, made to swell the index. It is obvious, therefore, that a book of moderate compass should use only sufficient space to reveal the *important general* subjects treated. Besides the general index, the following *self-indexing* dictionaries and departments should be consulted:

PAGE

Scientific Terms Used in Astronomy 37
Dictionary of Important Mineral Products 103
Scientific Terms Used in the Earth Sciences 117
Dictionary of Historical Race Groups 278
Tables of States and Territories 588
Table of State and Territorial Government 650
Colonial Divisions of the World 690
Great American and Foreign Battles 700
Right and Wrong Use of Words 718
Abbreviations, Contractions and Degrees 725
Words and Phrases from Modern Foreign Languages 742–754
Words and Phrases from Classic Languages 755
Pronouncing Dictionary of Literary Allusions . . . 782
Pronouncing Dictionary of Mythology 821

A — PAGE

Abbreviations . . 725–731
Abu-Simbel . . . 342, 349
Abydos 349
Accent, Marks of . . . 713
Of Words 713
Accounts, Laws Concerning 875
Achæan League 382
Acropolis, of Athens . . 378
Adjutant Bird 216
Africa, Countries of . . 443
Lakes of 80
Mountains of 76
Age of Pericles 377
Agra, Description of City 687
Taj Mahal 687
Air, Currents of 92
Alamo, The . . . 617, 618
Alaric, in Athens . . . 384
Albanians 278
Albatross 218
Alder 160
Alewife 225
Alexander the Great:
Conquest of Egypt . 347
Empire of 380
His Death and Successors 381
Invades Northern India 381
Invades Persia . . . 380
Second Invasion of Persia 381
Settles in Babylon . . 381
Syrian and Egyptian Campaigns 380
Alexander II., Russia 546–547
Alexandria 349
Schools of 347
Alfalfa 124
Allegory 733
Alligators 221
Alliteration 734
Allusions, Literary, 782 *et seq.*
Almond 136
Alpaca 245–246
Alphabet, Formed by Phœnicians 368
Alps, Outlying Spurs . 445
Alsace-Lorraine 504
Altdorf 570
Alum 103
Aluminum 103, 883
Amber 108
American Literature:
Colonial Period . . . 775
First National Period 776–777
Second National Period 777–778
Summary of 778
American Revolution:
Campaigns and Battles 636
Commanders of Armies 636
Forces Engaged . . . 636
Amœba 244
Amphibole 104
Anemones, Sea 243
Anglo-Saxon Kings of England 472

PAGE

Animalcules 244
Animal Kingdom:
Classification by Groups 191
Scientific Classification of . . 189, 190, 191
Why and How Animals are Classified 189
Animal Life:
In Cold Zones 122
In Temperate Zones . 121
Animals:
Amphibious 223
Animalcules 244
Ant-bear 204
Ant-eater 204
Antelope 199
Ants 238 239
Armadilio 204
Bees 238–240
Birds 208
Bison 200
Buffalo 200
Butterflies and Moths 236
Chamois 200
Ciliates 244
Coral-polyps 243
Deer 200
Domesticated 245
Elephant 203
Fishes 225
Flagellates 244
Fleas 240
Flies 240
Flying 205
Frog 223–224
Gayal 201
Gazelle 201
Giraffe 201
Gnats 240
Gnawing, or Rodents 198
Gnu 201
Hippopotamus . . . 203
Hoofed 199
Ibex 202
Jelly-fish 243
Joint-limbed 230
Kangaroo 204
Koala 204
Leeches 242–243
Lemmings 199
Mammals 191
Map Showing Distribution of Animal Life 188
Markhor 202
Marmot 199
Mice 199
Molluscs 229
Monkey Tribe . . . 191
Mosquitoes 240
Musk-Ox 202
Newts 224
Okapi 202
Opossum 205
Original Home of . . 122
Pachyderms 203
Pangolin 204
Porcupine 199
Pouched 204
Prairie Dog 199
Rabbit 199
Rats 199
Ray Animalcules . . 244
Reptiles 220

PAGE

Animals—Continued.
Results of Domestication 246
Rhinoceros 203
Salamander 224
Sambur 202
Sea Anemones . . . 243
Sea Cucumbers . . . 242
Sea Lilies 242
Sea Lion 246
Sea-Urchins . . 241–242
Seals 205
Simplest Forms of . . 244
Sloth 204
Sponges, Group of . 243
Squirrel 199
Starfishes 241
Tahr 202
Tapir 204
That Interest Me at the Zoo 193
Toad 224
Toothless 204
Tropical 121
Vicuna 202
Walrus 205
Wasps 238–240
Whales 207
Where First Domesticated 245
Wild Goats 202
Wild Pig 204
Worms 242
Zebra 203
Animals, Domesticated:
Alpaca 246
Ass 246
Camel 246
Canary 257
Carp 256
Cat 247–248
Cattle 248
Chickens 257
Dog 251–252
Domesticated Insects 261
Duck 258
Elephant 252
Gayal 252
Goat 252
Goldfish 256
Guinea-pig 252
Horse 252–253
Llama 254
Pig 255
Rabbits 254
Reindeer 254
Sheep 254
Swine 255–256
Yak 245
Zebu 256
Animals, Flying 205
Fox 206
Frog 206
Animals of Prey:
Badger 194
Brown Bear 194
Caracal 194
Coyote 198
Fox 194
Hedgehog 195
Hyena 195
Ichneumon 195
Jackal 195
Jaguar 195
Leopard 195

PAGE

Animals of Prey—Con.
Lion 195
Lynx 196
Martin 196
Mink 196
Mole 196
Mongoose 197
Ocelot 197
Otter 197
Polar Bear 194
Puma, or Cougar . . 197
Raccoon 197
Sable 197
Shrew 197
Tiger 197
Wolf 197
Annotto 166
Antarctic Ocean . . . 85
Ant-bear 204
Anteater 204
Antelope 199
Antimony 108
Antiochus the Great . . 382
Antithesis 734
Antony, Mark 398
Apennines, The 511
Apostrophe 733
Apothecaries' Liquid Measure 860
Apothecaries' Weight . 863
Appian Way 389
Apple 136
Apricot 136
Arabian Nights, Pictures of Arabian Life . . 407
Arabians 278
Architecture:
Assyrian 357
Babylonian 357
Egyptian 349
Persian 371
Arctic Ocean 84
Argentina:
Buenos Aires 673
Cities 673
Climate 673
Government 673
History 673
People 673
Physical Features . . 672
Production and Industry 673
Rivers 672
Argonaut 229
Argument 739
Arithmetic . . . 850 *et seq.*
Decimal Fractions . 854
Denominate Numbers 856
Fractions, Common . 851
Arlington Cemetery, National Military . 626
Armadillo 204
Armenians 278
Arminius, Defeats Legions of Varus . . 240
Army and Navy of Germany 497
Arnold, Benedict . . . 637
Arsenic 108
Artaxerxes 370
Artichoke 129
Asbestos 113
Ash 160
Asia:
China 677

PAGE
Asia—Continued.
Countries of 443
Famous Mountains of 75–76
India 684
Japan 687
Lakes of 77
Asparagus 128
Aspen, or Trembling Poplar 160
Asphaltum 108
Ass 246
Assiout, Dam and Barrage at 345
Assuan 350
Irrigation Dam at . . 345
Assyria 353
Cities 355
Civilization of . . . 357
Dynasties of . . 355–356
Empire of 355
Extent of Empire . . 356
Fall of Empire . . . 356
History of 355
Inscriptions 355
Nineveh 355
Period of Greatest Splendor 356
Reign of Sargon . . 356
Religion 357
Assyrian Empire (Map) 298
Assyrians 278–297
Asterisk 733
Asterism 733
Astronomy . . . . 12 *et seq*
Scientific Terms Used in 37
Athens 555
Acropolis 378
Alaric in 384
Downfall of 379
Early History . . . 375
Under Cimon 377
Under Pericles . . . 377
Under a Pure Democracy 376
Atlanta, Description of 501
Atlantic Ocean 84
Atmosphere:
Composition of . . . 89
Forms of Vapor . . . 94
Height of 89
How Weighed and Measured 89
Winds and Currents . 92
Atmospheric Vapor . . 94
Atoms, Radioactive . . 848
Augustus Cæsar . . . 399
Augustus, Death of . . 401
Aurora-Borealis . . 101–102
Austria:
Historical Outlines . . . . . 419 *et seq.*
Salzburg 532
Salzkammergut . . . 533
Austro-Hungary . . . 527
Austria-Hungary:
Austria and the French Revolution 535
Austro-Prussian War 536
Budapest 529
Cities and Towns . . 529
Climate and Landscape 528
Congress of Vienna, Period of Metternich 535
Conquest of Hungary 536
Division of Empire . 534
Ferdinand II. and Thirty Years' War 534
Francis Joseph, Emperor 535–536
Hapsburg Power through Marriage 534
Hapsburg-Lorraine Line of Rulers . . 535
History of 534
Historical Outlines . . . . . 435 *et seq.*
Industries and National Resources 528
Lakes of 528
Leopold I. and the War of the Spanish Succession 535

PAGE
Austria-Hungary—Con.
Location and Extent . 527
Loss of Italian Possessions 536
Peoples and Races . 528
Period of Reforms . . 536
Prague 531
Racial Difficulties Bearing upon the European War . 536–537
Religion and Education 528
Revolution of 1848 . 535
Rivers and Lakes 527–528
Sovereigns of 537
Struggle between Austria and Prussia, 536
Surface Features . . 527
Under Charles V. of Germany 534
Union of Austria and Hungary 536
Vienna 529
War of the Austrian Succession 535
Austro-Prussian War . 697
Austro-Swiss War . . . 695
Avoirdupois Weight . . 860
Ayr 464

B

Babel, Tower of . . . 354
Baboon 192
Babylon, City of . . . 354
Taken by Alexander the Great 381
Under Belshazzar . . 357
Babylonia 353
Architecture 357
Art of 357
Civilization of . 353, 357
Conquered by Assyria 354
Famous Cities of . . 353
Historical Outlines . . . . . 312 *et seq.*
History of 354
Land of 353
Later Empire 356
Period of Hammurabi 354
Reign of Nebuchadnezzar 356
Religion 357
Babylonian Captivity of the Jews 360
Babylonians . . . 278, 297
Baden, Cities of . . . 504
Badger 194
Bagdad, Capital of Eastern Saracens . . . 407
Railroad 577
Balkans, The, Historical Outlines . . 437 *et seq.*
Balkan War 698
Baltic Sea 86
Baltimore:
Buildings, Divisions, Institutions, Parks, Streets, etc. . . . 591
Description of . . . 591
Johns Hopkins University 591
Bamboo 166
Banana 142
Banana Plant 143
Banting 246
Barbarian Invasions of Roman Empire . . 694
Barbizon 486
Barium 108
Barley 124
Barnacle 231
Basques 280
Bass 225–226
Bats 205
Battles:
American Civil War 634, 644
American Revolution 636
Mexican War . . . 641
War of 1812 638
Great, Historical Outlines . . . . 312 *et seq.*
Great American and Foreign . . . 700–710

PAGE
Battles—Continued.
Contesting Nations or Parties . . 700–710
Name, Location and Date 700–710
Results 700–710
Bauxite 103
Bavaria, Cities of . . . 503
Beans 128
Bear, Brown 194
Beaver 198
Beech 160
Bees:
Bumble 240
Honey . . . 238–240, 261
How the Honey-comb is Made 262
Organization of Hive 261
Structure of 262
What Swarming Means 262
Where the Honey Comes from . . . 262
Wonderful Mouth and Legs of . . . 262
Workers and Drones 261, 262
Beetles:
Bombardier 232
Cantharis 232
Colorado 234
Stag 234
Water 234
Begonia 148
Belgium 548
Cities 549
Climate and Landscape 548
Government 549
History of 550
People 548
Products and Industries 549
Religion and Education 549
Rivers 548
Surface 548
Belisarius, Conquests of 404
Belshazzar, Reign of . . 357
Benares 686
Berbers 280
Berkeley, California . . 620
Berlin 499
Bourse or Exchange . 501
Business Quarter . . 499
Cathedral 502
Culture and Education 501
Dramatic Theater . . 500
German Cathedral . 500
Industries of 501
Opera Platz 500
Panorama of 498
Parliament Buildings 505
Royal Library . . . 500
Royal Museum . . . 500
St. Hedwig's Church 501
Suburbs of 501
Tempelhofn Feld . . 500
Unter den Linden . . 499
Berne 571
Cathedral 571
Clock Tower 572
Betel-nut 166
Bethlehem 364
Market Place in . . 365
Big Trees, California . . 585
Bingen 452
Biography, Historical Outlines . . 312 *et seq.*
Styles of Composition 738
Birch 160
Birds:
Adjutant 216
Albatross 218
Bittern 216
Blackbird 212
Bobolink 213
Bobwhite 219
Canary 213
Cassowary 219
Catbird 213
Chickadee 213
Chicken 219
Climbing 211
Condor 209

PAGE
Berlin—Continued.
Crane 217
Crossbills 213
Cuckoo 211–212
Eagle 209
Egrets 208
Emu 219
Falcon 209
Finch 213
Flamingo 218
Game 219
Grebes 218
Grouse 219–220
Grosbeaks 214
Guinea 220
Gulls 218
Hawks 209
Heron 217
Ibis 217
Jays 214
Lark 214
Mockingbird 214
Nightingale 214
Of Paradise 212
Of Prey 209
Orioles 215
Osprey 210
Ostrich 210, 219
Owls 210
Parrots 212
Partridges 220
Peacock 211, 220
Pelican 219
Penguin 219
Pheasants 220
Plovers 217
Ptarmigan 220
Quail 220
Rhea 219
Robin 215
Running 219
Singing 212
Sparrows 215
Stork 217–218
Swallows 215
Swans 219
Swimming 218
Thrasher 216
Thrush 216
Toucan 212
Turkey 220
Vultures 211
Wading 216
Warblers 216
Woodcock 218
Woodpecker 212
Wrens 216
Bismarck, Otto von . . 508
Bison 200
Bittern 621
Blackbird 212
Black Hellebore 168
Black Mica 104
Bluefish 226
Blue-grass 124
Blue Grotto 87
Bobolink 213
Bobwhite 219
Boer War 470, 698
Bohemia, Historical Outlines . . 415 *et seq.*
Bombay 686
Books, Famous . 782 *et seq.*
Borax 115
Bosphorus, Panorama of 573
Boston 592
Boston Common . . 593
Bunker Hill Monument 593
Chief Industries of. . 595
Custom House . . . 592
First Church of Christ, Scientist 592
Notable Buildings and Parks 594–595
Notable Churches . . 595
Parks and Squares . 595
Public Library . . . 593
Roman Catholic Cathedral 592
Simmons College for Women 594
State House 593
Tremont Street . . . 593
Trinity Church . . . 592

INDEX

PAGE

Boston College 594
Boston University . . . 594
Botany, Classification of Plants 182–186
Vegetable Kingdom 119–186
Bourbon, House of . . 494
Bourbon Line 490
Bourbons, Restoration of 494
Brace 733
Brackets 732
Bramaputra 685
Brazil:
Cities 675
Climate 674
Government 675
History 675
People 674
Production and Industry 674
Rivers 674
Surface 674
Bread-fruit 138
Bridal Veil Falls . . . 83
Bristle-worms 242
British Empire:
Constitution 652
Executive Departments of 654
Government . . 652–662
Judicial Departments 660
Meaning of 454
Parliament of 656
Sovereigns of 652
British Isles, Mountains of 75
British North America . 579
Broadway, New York . 609
Viewed at Night . . 609
Brome-grass 124
Brussels 550
Column of the Congress 551
Palace of Justice . . 549
Town Hall 550
Brussels Sprouts . . . 130
Bucharest 562
Buckwheat 125
Budapest . . 529, 532–533
Buenos Aires 673
Buffalo 200
Building Stones 108
Bulgaria 551
Cities 552
Government 551
History 552
People 551
Productions. 551
Sofia 351, 552
Bulgarians 280
Bullhead 226
Bunker Hill, Battle of . 636
Burr Artichoke 129
Butterfly 235
Butternut 138
Buttonwood 160
Byzantine Empire . . 404
Conquered by Turks . 404
Conquests of Belisarius 404
Historical Outlines . . . . . 411 *et seq.*
Overrun by Greeks and Persians . . . 404
Reign of Justinian . . 404

C

Cabbage 130
Cacao 138
Fruit or Pods 136
Cactus 173, 174, 175
Cæsar:
And Cleopatra . . . 397
Antony's Oration . . 298
Assassination of . . . 397
Conspiracy against . 397
Dictator of Rome . . 396
Rivalry with Pompey 396
Struggle with Pompey 396
Triumphal Return to Rome 397
Cairo 350
Calcutta 686

PAGE

Calendar 866
Perpetual 867
California Darlingtonia 171
Caliphate, in Spain . . 407
Caliphs 406
Of Bagdad 407
Calomel 114
Cambridge 595
Andover Theological Seminary 595
Educational Institutions 595
Harvard University . 595
Historical and Literary Interests . . . 595
Industrial Establishments of 595
University of 466
Washington Elm . . 595
Cambyses 369
Camel 246
Campaigns:
American Civil War 643–644
American Revolution 636
War of 1812 638
Camphor Tree 158
Canaan, Land of . . . 359
Cana, of Galilee . . . 364
Canada:
Area and Population . 666
Cities 668
Climate 666
Colleges and Universities 667
Government 668
History 669
Lakes and Rivers . . 666
Parliament Buildings 668
People 667
Physical Features . . 666
Products and Industries 666
Religion and Education 667
Canary 213, 257
Capacity, Measures of . 860
Capet, House of . . . 493
Capetians 488
Capital Letters:
Rules for 724–725
Use of 724
Capitals:
Of Countries of the World 443
Of States . . . 588–590
Capri, Blue Grotto of . 87
Caracal 194
Carlovingians . . . 488–493
Carnation 148
Carp 226–256
Carpeting 858
Carrots 130
Carthage:
Character of State and People 390
Defeat of Hannibal at Zama 391
Destroyed by the Romans 391
Founded by Phœnicians 367
Hamilcar in Spain . . 390
Punic Wars 389
Struggles with Rome 389
Carthaginians 280
Caspian Sea 77
Cassava 143
Cassowary 219
Castle, Windsor . . 464–466
Castles, of the Rhine . 447
Cat 247–248
Characteristics and Habits 248
Intelligence of . . . 248
Superstitions Regarding 248
Varieties of 247
Catbird 213
Catiline, Conspiracy against Rome . . 395
Cattelya 148
Cattle:
As a Form of Industry 250

PAGE

Cattle—Continued.
Economic Value of the Cow 251
Experiment in Values of 250
General Types of . . 248
Representative Breeds 248
Caucasus 446
Cauliflower 130
Caxton, Influence on English Literature . 764
Cedar 160
Celery 130
Celts or Kelts 280
Central Park, New York 611
Century Plant 174
Cephalotus 171
Cereals 123
Chaldeans 281
Chameleons 222
Chamois 200
Champlain, Lake of . . 76
Charlemagne:
Contributions to Civilization . . . 409
Crowned Emperor at Rome 408–409
Emperor of Germany 505
Germanic Empire of . 407
Relation to the Church of Rome 408–409
Subdues Saxons and Bavarians 408
Charles the Great (Charlemagne) . . 407
Charles V., Emperor of Germany . . 490–507
Charles VII., King of France 489
Charles Martel, Defeats Saracens at Tours . 406
Charts:
Comparative Classification of Races and Peoples 293
Development of Man 273
Diagram of Solar System 12
Greek and Roman Mythology . . 846–847
Historical Maps of World 298, 300, 302, 306, 308
Charybdis 87
Chaucer, Place in English Literature . . 763
Chayote 129
Cheops, King 346
Chemistry 880–895
Chestnut 160
Chicago 596
Building Architecture of 596
Business Thoroughfares 596
Center of Railroad Industry 598
Chief Manufactures of 598
Educational Institutions 598
Famous Union Stockyards 598
Lake Shore Drive, and Boulevards 596
Loop District, or Principal Business Section of the City 596
Nationality of Inhabitants 596
Parks and Special Attractions 597
Public Library . . . 596
Tunnel System . . . 598
University of Chicago 597
Chickadee 213
Chickens 219–257
Leading Breeds of Poultry 257
Children:
Education and Care of 945
Health of 945
School Life of . . . 945

PAGE

Chile:
Cities 676
Climate 676
Government 676
History 677
Physical Features . . 676
Production and Industry 676
Chimpanzee 192
China:
Area and Population 677
Bridges 678
Canals 679
Cities 682
Climate 680
Government 682
Great Chinese Wall . 679
Historical Outlines . . . . . 41 *et seq.*
History 683
Pagodas 680
Peking 682
People, Religion and Education 681
Production and Industry 680
Rock-hewn Temples at Lungmen . . . 681
Seas, Rivers and Canals 678
Surface 677
Chinchilla 198
Chinese 281
Chinese Wall 679
Chinese-Japanese War . 698
Christ, Birth of 400
Christian Era, Beginning of 400
Christians 559
Christianity under Constantine 403
Chrome 109
Church:
Historical Events . . . . . 411 *et seq.*
Historical Outlines . . . . . 411 *et seq.*
Ciliates 244
Cimon, Adorns Athens . 377
Cinchona 166
Cincinnati 598–599
As a Center of Music and Art 599
Chief Places of Public Interest 599
Educational Institutions 599
Notable Buildings of 599
Parks and Museums . 599
Principal Streets, Shopping and Residential 599
Rivers and Famous Bridges of . . 598–599
University of Cincinnati 599
Cinnamon 138
Circular Measures . . . 864
Cities:
(See under various countries and states, and individually.)
Civilization:
Assyrian 357
Babylonian 357
Contributions of Charlemagne . . . 409
Egyptian . . . 343–348
Great Periods in 312 *et seq.*
Oriental 299
Saracenic 407
Where It Began . . . 299
Civil War, American:
Campaigns and Battles 642–644
Causes and Results . 643
Commanders 643
Killed and Wounded 643, 644
Civil War in England . 696
Civil Wars of Roman Empire 694
Classic Tales and Stories 820–847

PAGE
Classic Words and Phrases 755
Clay 103
Cleopatra and Cæsar . 397
Ruler of Egypt . . . 347
Suicide of 398
Cleveland 599–600
Bridges and Viaducts 599
Chief Buildings of 599 600
Chief Business Streets 599
Chief Industries . . 600
Euclid Avenue . . . 599
Parks and Public Squares 599
Public Library of . . 599
Water Front 599
Climate 89
Affected by Winds and Ocean Currents 99
Atmospheric Vapor . 94
Desert Regions . . . 99
Dew 94
Distribution of Temperature 90
Effect of Earth's Motions 90
Effect of Rainfall . . 99
Effect of Unequal Days and Nights . 92
Equinox 90
Figures Illustrating . 91
Glaciers 97
Heat of Sun 90
How Affected by Land and Water 97
Icebergs 97
Influence of Elevations 99
Mists and Fogs . . . 94
Nature's Wonders of 101
Seasons 91
Snow 94
Supreme Influence of the Sun 97
Climax 734
Clouds 94–95
Colors of 102
Forms of 93–94
Clove 138
Clover 125
Coal 109
Cobalt 109
Coblence (Koblenz) . . 450
Cocoa Beans, Drying and Roasting of . 137
Cocoa-nut 138
Cod 226
Coffee, Production and Treatment of the Berry 139–140
Coffee Tree 138
Colleges and Universities, see individual names.
Cologne 448
Colon 731
Colonial History of the United States:
Colonial and Indian Wars 628–633
English Explorers . . 629
Foreign Rulers and Events . . . 628–633
French Explorers . . 628
Oppression under British Rule . . . 635
Portuguese Explorers 628
Progress and Population 631, 633
Spanish Explorers . . 628
Colonies of Countries of the World 690
Colonies:
Area and Population 690
Governing Country . 690
In Africa 690
In Asia 690
In Europe 691
In North America . . 691
In Oceania 692
In South America . . 691
Of France 493
Of Germany 504
Tables of 690

PAGE
Colorado River:
Description 582
Grand Cañon 582
Colugo 205
Columbus 310
Commerce, Phœnician . 368
Commercial Law . . . 870
Como, Lake 76
Comparative Government 652–662
Condor 209
Congress, American Continental . . . 635
Consonants 713
Tables of Sounds . . 713
Consulate of France . . 494
Constantine the Great . 403
Favors Christianity . 403
Makes Byzantium His Capital . . . 403
Constantinople 574
Dolma-Bagtche Palace 576
Egyptian Obelisk . . 576
Mosque of St. Sophia 574
Palaces and Mosques 575
Panorama of 575
Situation and Description of 574
Yildiz Palace 577
Constellations 24
(See also Stars.)
Mythology of 36
Visible Each Month . 30
Continents 51–52
Area and Population 442
Average Height of . 52
Contractions . . . 725–731
Copenhagen 554
Frederick's Church . 554
Copper 104–109
Coral Islands 58
Coral-polyps 243
Cork Oak 162
Corn 125
Costliest Ears in the World 125
Coronas 101, 102
Correct English 712
Corundum 103, 104
Cotton 166
Cougar 197
Countries:
(See also individual names.)
(See Book of Nations, 297 *et seq.*)
Area 443
Capitals of 443
Colonies of 690
Comparative History of Nations . 312 *et seq.*
Forms of Government 442
Independent Countries of the World . . . 443
Population 443
Salary of Ruler or Head 443
Statistics of 443
Wealth of 443
Coyote 198
Crabs 230, 231
Cranberry 143
Crane 217
Crayfish 231
Crickets 237
Crimean War . . . 469, 597
Crocodiles 221
Crossbills 213
Crusades, Wars of . . . 695
Cryolite 103
Cryptogams 158
Cubic Measure, Applications of . . 859, 860
Cuckoo 211–212
Cucumber 130
Currant 143
Currents:
Air 92
Gulf Stream 88
Ocean 88
Polar 88
Cuttlefish 229

PAGE
Cyaxares, the Mede . . 369
Cypress 162
Cyrus the Great, Founds Persian Empire . . 369
Czars, of Russia . . . 548

D

Dacian War 694
Dagger 733
Dahlia 148
Damascus 364
Danish America . . . 579
Danish Kings of England 472, 473
Danish War 697
Danish West Indies . . 579
Danube, The 453
Chief Towns of . . . 454
Description of . . . 453
Historic Importance . 454
Dardanelles, Allied Campaign against 577
Darius the Great . . . 370
Darius III., Last of the Persian Emperors . 371
Dark Ages 403
Darnell 168
Dash 732
Date, Date-Palm . . . 138
David 359
Day, Where It Begins . 867
Day and Night, How Caused 91
Law of Variation . . 92
Days, Names of . . . 868
Days and Nights, Table of Unequal 92
Dead Sea . . 77, 362, 363
Deadly Nightshade . . 168
Decimal Fractions . . 854
Deer 200
Degrees 725–731
Delhi, Description of. . 686
Deltas 71
Democracy, Established in Rome 388
Demosthenes, Inveighs against Philip of Macedon 380
Denmark 553
Cities 554
Climate 553
Copenhagen 554
Government 554
Historical Outlines . . . . . 411 *et seq.*
History 554
People 553
Production and Industry 553
Surface 553
Denominate Numbers . 856
Reduction of . . 856–857
Denver 600
Chief Sources of Wealth 601
Climate 601
Educational Institutions 601
Main Business Streets 600
Notable Buildings of 600
Principal Features of 600
Surrounding Mountains 600
Description, Forms of Written 739
Desert of Gobi 99
Deserts and Desert Regions 99
Deserts, of Egypt . . . 344
Des Moines 600
Des Moines College . 600
Drake University . . 600
Manufacturing and Commercial Importance 600
Detroit 601
Center of Commercial and Industrial Activity 601
Parks 601
Principal Business Streets 601

PAGE
Detroit—Continued.
Prominent Buildings . 601
Public Library . . . 601
Dew 94
Diagrams:
Earth's Strata . . . 40
Famous Mountains 72, 73
Famous Rivers . . 72, 73
Showing Average Height of the Continents 52
Diamond 109–110
Diamonds, Celebrated, of the World . 111, 112
Dictionaries:
Classic Words and Phrases 755
French Words and Phrases 742
Gems or Precious Stones 109, 110, 111, 112
German Words and Phrases 742
Historical Race Groups . . . 278–292
Italian Words and Phrases 742
Literary Allusions . . . . . 782 *et seq.*
Minerals 103
Modern Foreign Languages 742
Of Mythology . 820–847
Scientific Terms Concerning Animals 263–264
Scientific Terms Used in Astronomy . . . 37
Scientific Terms Used in Botany, 176, 177, 178, 179, 180, 181, 182
Scientific Terms Used in the Earth Sciences . . . 117, 118
Spanish Words and Phrases 742
Didactic Poetry 740
Dog 251–252
Different Breeds of . 251
Dogwood 162
Dolphin 207
Domesticated Animals 258–262
Dorian Invasion . . . 373
Dorians 374
Dormouse 198
Douc 192
Draco, Laws of 375
Dragon, Flying 222
Drama:
Dramatic Poetry . . 740
How to Write . . . 738
Dresden 503
The Zwinger 503
Dry Measure 860
Duck 248
Chief Breeds 258

E

Eads Bridge 622
Eagle 209
Ear 933
Middle 935
Physiology and Structure 933
Plate of Internal . . 934
Earth:
Animal and Plant Life in Strata of . . . 40
Area and Population by Continents . . 442
Characteristic Rocks 48, 49
Cross-section Showing Interior 41
Distribution of Plants and Animals . . . 121
Effect of Motions on Climate 90
Electricity of 101
Geological Growth of 48, 49
Heat of 41

INDEX

PAGE

Earth—Continued.
Hemispheres and Continents 443
Land Forms . . . 51, 52
Languages of 442
Life Ages of . . . 48, 49
Life upon 121
Minerals of . . 48, 49, 103
Races and Populations 442
Revolutions of . . . 91
Rotation of 91
Structure and Surface 41
Tropical Life 121
Vegetable Kingdom . . . . . 119 *et seq.*
Earthquakes 65
Causes and Motions of 65
Notably Destructive Ones of History . 66, 67
Earth Sciences, Glossary of Scientific Terms 117, 118
Earthworms 242
Earwigs 237
Eastern or Byzantine Empire 404
Historical Outlines . . . . . 411 *et seq.*
Ebony 162
Ecbatana 371
Eclipses 34, 35
Edinburgh 462
Editorials 739
Education, of Children . 961
Eel 226
Egg-plant 130
Egrets, American . . . 208
Egypt:
Ancient Population . 344
Architecture 349
Assuan Dam 345
Cheops or Khufu . . 346
Cities 349
Civilization of . . . 348
Cleopatra 347
Climate 344
Conquered by Alexander 347
Conquered by Persia 347
Deserts of 344
Doctrine of Future Life 349
Embalming 349
Exodus of Israelites . 359
Extent of 343
Fall of 398
Government of . . . 348
Greek Rulers of . . . 347
Heliopolis 351
Hieroglyphics 346
Historical Outlines . . . . . 312 *et seq.*
History of, Sculptured in Eternal Rocks . 342
How We Know Its History 346
Irrigation 345
Israelites in 359
Kings 348
Lakes of 344
Land of 343
Nile 343
Nile Valley . . . 343, 344
Oases of 344
Oldest Civilization in 343
Painting 349
Pawn of Turkey, France and England 348
Priests 348
Psametik 347
Ptolemies 347
Pyramids . 342, 350, 351
Pyramid Builders . . 346
Rameses 347
Religion 348
Roman Province . . 347
Rosetta Stone . . . 346
Sculpture 349
Shepherd-kings . . . 342
Social Castes 348
Soldiers and Warriors 348
Sphinx 342, 351

PAGE

Egypt—Continued.
Suez Canal 352
Temple at Abu-Simbel 342
Thebes 347, 352
Under Mohammedans 348
Egyptians 281, 297
Ehrenbreitstein 450
Eiffel Tower 483
Elder 144
Electricity, in Nature . 101
Elephant 203, 252
Elizabeth, Elizabethan Period in English Literature 770, 771, 764–765
Elizabethan Period . . 468
Ellipsis 733
Elm 162
Embalming, Egyptian . 349
Emerald 110
Emery 103
Emperors of Rome . . 401
Emphasis, or Inversion 734
Empire of Charlemagne:
Division of 409
Extent of 407
First Union of Germans under One Head 408
Northern Italy United to It 408
Plan of 407
Empire, of France . . . 494
Empire, Second, of France 494
Emu 219
England:
(See also British Empire, British Isles and Great Britain.)
Government . . 652–662
Money and Coins . . 869
Table of Sovereigns . . . . . 472 *et seq.*
English, How to Speak Correct 712
Spoken 712
English Civil War . . . 696
English, Correct . . . 713
Abbreviations, Contractions and Degrees 725–731
Accent of Words . . 713
Capital Letters . . . 724
Choice and Use of Words 717
Common Errors in Pronunciation . . 715
Expression 716
Figures of Speech . . 733
Forms of Written English 734
Fundamental Rules . 712
Grammatical Connections 716
Inflection of Voice . . 716
Organ of Speech . . 712
Punctuation . . 731–733
Rhetoric 733
Right and Wrong Use of Words . . . 718–724
Rules of Pronunciation 714
Rules Relating to Style 717
Vowels 712
Written English . . 716
English History 466
Anglo-Saxon Period . 466
Creation of England and Scotland . . . 466
Norman Conquest . . 466
Periods of . . 466 *et seq.*
Roman Period . . . 466
English Lake District . 457
English Literature:
Anglo-Saxon Period 762, 763, 769
Beginning of English Comedy and Tragedy 765
Chaucer 763
Elizabethan and Puritan Periods 770, 764–765

PAGE

English Literature—Con.
Elizabethan Prose Writers . . . 765–766
English Period to the Time of Elizabeth 770
Influence of Caxton . 764
Norman-French Period . . 763, 769–770
Pre-Elizabethan Period 770
Puritan Period . . . 766
Restoration to the Rise of the Novel 766–771
Rise of the Novel and Period of Romanticism 767–772
Romanticism and the Early Nineteenth Century 768
Shakespeare 765
Summary of Writers . 769
Tennyson and Other Poets 769
Victorian Period to the Present 768–775
English Money 869
English, Written . . . 716
Argument 739
Biography 738
Description 739
Editorials 739
Essay 739
Exposition 739
Fiction and Drama . 738
Forms of 734
Forms of Poetry 734, 73
Letter Writing . . . 734
Narration 738
News and the "Story" 738
Poetics 739
Prose 734
Epic Poetry 739
Epigram 734
Equatorial Currents . . 88
Equinox, Autumnal . . 90
Vernal 90
Escurial 566
Essay, The 739
Estuaries 71
Eton College 466
Etruscans 282
Eucalyptus 162
Euphemism 734
Euphrates 353
Region around . . . 299
Europe:
Alpine Region . . . 445
Continent of 444
Countries of 443
Danube 453
Famous Mountains of 74, 75
Great Powers of . . 454
Grouping of Nations 454
Gulfs and Inlets . . 444
Highlands of France . 445
Lake Region of . . . 454
Lakes of 77
Lowlands of 445
Mediterranean and Its Arms 444
Mountains and Highlands 445
Mountains of Italy and Balkans . . . 446
Nations of . . 454 *et seq.*
Outline and Extent . 444
Peninsulas of 444
Pyrenees and Spanish Peninsula 446
Rhine 447
Rivers and Lakes . . 447
Surface Characteristics 444
Surface of Islands . . 446
European War of 1914-1917 698–699
Events, Great Historical . . . . . 312 *et seq.*
Exclamation Point . . 731
Exemption Laws . . . 875
Exodus of Israelites . . 359

PAGE

Explorers:
English Explorers of United States . . . 629
French Explorers of United States . . 628
Portuguese Explorers of United States . 628
Spanish Explorers of United States . . . 628
World's Greatest 310–311
Exposition, Forms of English 739
Expression 716
Inflection of Voice . . 716
Eye:
How Color is Determined 93
How We See 93
Retina 93
Rods and Cones . . 93
Sense of Sight . . . 93
Structure and Marvels 93

F

Fables 820–847
Fairmount Park . . . 615
Falcons 209
Famous Books . 782 *et seq.*
Famous Mountains 72, 73, 74, 75, 76
Name and Location of 74, 75, 76
Of Africa 76
Of Asia 75, 76
Of British Isles . . . 75
Of Europe 74
Of North America . . 74
Of Oceania 75, 76
Of Pacific Islands . 75, 76
Of South America . . 76
Famous Waterfalls of the World 80
Height of 80
Location of 80
Famous Writers 782 *et seq.*
Feldspar 103
Fiction, How to Write 738
Fifth Avenue, New York . . . . . 611 *et seq.*
Figs 141
Figures of Speech . . . 733
Finch 213
Fir 162
Firefly 232
Fishes, Classification and Description of 225–229
(See also under separate Names.)
Flagellates 244
Flamingo 218
Flax 167
Fleas 240
Flies 240
Flowering Shrubs, Description of 155, 156
Flowerless Plants . . . 158
Flowers:
Best Annual . . 150, 151
Best Perennials 151, 152, 153, 154
Classifications of 147, 148
Cultivation of . 150, 151
Description of Annuals 150, 151
Description of Best Perennials 151, 152, 153, 154
Guide for Selection 150, 151
Wild 157
Flying Animals 205
Bats 205
Colugo 205
Fish 226
Fox 206
Frog 206
Phalanger 205
Squirrel 205
Fog 94
Folklore 820–847
Fontainebleau 486

PAGE
Fool's Parsley 168
Forage Plants 123
Forest Trees 160
Fossils 46
Fox 194
Flying 206
Fractions, Common . . 851
Decimal 854
France:
Amiens Cathedral . . 487
Barbizon 486
Beginning of 409
Bourbon Line . . . 490
Capetians 488
Carlovingians . . 488, 493
Charles VII. and Joan of Arc 489
Chief Magistrate and His Powers 653
Cities and Towns . . 478
Climate and Soil . . 477
Colonies and Dependencies 493
Consulate . . . 491, 494
Divisions of 476
Empire of 494
Empire, Second 491–492, 494
Executive, Departments of 655
Government of . 653–662
Fontainebleau . . . 486
Franco-Prussian War 492
Highlands of 445
History of 487
House of Bourbon . . 494
House of Capet . . . 493
House of Orleans 491, 494
House of Valois . . 494
House of Valois and the Hundred Years' War 489
Industrial Centers . . 486
Industries and Trade 477
Judicial Department . 661
Legislative Department of 657
Location and Extent 476
Louis IX. 488
Louis XIV. 490
Merovingians . . 487, 493
Money and Coins 869, 870
Napoleon and the Directory 491
Naval and Military Centers 486
Paris 478
People 478
Petit Trianon, Versailles 486
Products of Soil . . . 477
Religion and Education 478
Republic, First . . . 494
Republic, Second . . 494
Republic, Third . 492, 494
Restoration 491
Restoration of the Bourbons 494
Revolution . . . 490–491
Revolution of 1848 . 491
Roman Rule of . . . 487
St. Denis 483
Sovereigns and Presidents 493
Surface and Mountains 477
Teutonic Invaders . 487
Under the Romans . 487
Versailles 483
Wars of Francis I., and Charles V. of Germany 490
Francis I., King of France 490
Franco-Prussian War 492, 698
Frederik the Great . . 508
French, Influence on English Literature 763, 769–770
Revolution 696
Words and Phrases . 742
(See also France.)

PAGE
Freshwater Lakes:
Area of 79, 80
Elevation of . . . 79, 80
Location 79, 80
Frog, Flying 206

G

Galago 192
Gallic War 694
Ganges 685
Garden of the Gods . . 584
Garnet 110
Gauls:
Invasion of Italy . . 693
Of Northern Italian Peninsula 386
Gayal 201, 252
Gazelle 201
Gecko 222
Gems 109
Geography:
Distribution of Races 275, 276
Historical . . 299 *et seq.*
Literary . . . 782 *et seq.*
What It Is 299
Geography and Discovery . . . . 299 *et seq.*
Geology, View of the Growth of the Earth 48–49
Geranium 148
German Empire . . . 495
Division of 495
Executive Departments of 655
Government and Constitution of . . 653–662
Judicial Department of 661
Kaiser and His Powers under the Constitution 653
Legislative Department of 657
German Words and Phrases 742
Germans:
First Defeat of Romans 400
(See also Germany, German Empire, Holy Roman Empire.)
Empire of Charlemagne 407
Germany:
(See also German Empire.)
Accession of William II. 509
Army and Navy . . 497
Baden, Cities of . . 504
Beginning of 409
Berlin 499
Bismarck's Domination 508
Charlemagne, King . 505
Charles V. 507
Chief Cities 498
Cities of Bavaria . . 503
Climate of 496
Colonies of 504
Commercial and Colonial Expansion . . 509
Confederation . . . 508
Contest between Prussia and Austria 508
Defense of 497
Divisions of the Empire 495
Dresden 503
Educative and General Culture 497
Elsass-Lothringen . . 504
Feudal System . . . 505
Frederick the Great and the Seven Years' War . . . 508
Government . . 653–662

PAGE
Germany—Continued.
Hapsburg Line . . . 507
Henry I. 506
Historical Outlines . 410
History of 505
Hohenstaufen Line . 506
House of Luxembourg 507
Independence of Austria and Union of Germany . . 508–509
Internal Communications 496
Interregnum 507
Leipzig 503
Money and Coins . . 870
Otto the Great . . . 506
People and Language 497
Potsdam 501
Productions and Industries 496
Prussian Cities . . . 502
Reformation 507
Religion of 497
Restoration of German Empire . . . 509
Rise of Prussia to Power 508
Rivers of 495–496
Romans, First Contact with 505
Smaller States, Cities of 504
Struggle with the Papacy 506
Surface Characteristics 495
Thirty Years' War . 507
Under the House of Franconia 506
Württemberg 503
Gethsemane 364
Geysers 67
Of Iceland, and New Zealand 67
Of Yellowstone Region 67
Giant's Causeway . . . 456
Giraffe 201
Gizeh 350
Glaciers 97
Famous Regions of . 97
Gladitorial War 694
Glow-worms 234
Gloxinia 148
Gnats 240
Gnawing Animals . . . 198
Beaver 198
Chinchilla 198
Dormouse 198
Hare 198
Gnu 201
Goat 252
Wild 202
Goddesses 820–847
Gods 820–847
Gold 112, 104
Golden Gate Park . . . 620
Goldfish 226, 236
Goose 258
Chief Breeds 258
Gooseberry 144
Gorilla 192
Government 549
Of Argentina 673
Of Brazil 675
Of British Empire, 652–662
Of Canada 668
Of Carthage 390
Of China 682
Egyptian 348
Forms Adopted by Various Nations . 442
France 653–662
Germany . . . 653–662
Greece 555
India 686
Japan 688
Mexico 670
Norway 559
Portugal 561
Roman 389
Roman Provincial . . 391
Rome under the Empire 399
Roumania 562

PAGE
Government—Continued.
Servia 563
Spain 565
Sweden 567
Switzerland 571
Turkey 574
United States . . 652–662
United States, British Empire, Germany and France Compared 652–662
Gracchi, The 394
Grammar, Errors of 716–717
Grammatical Connections 716
Grampus 207
Grand Cañon 582
Grant's Tomb, New York City . . 612, 613
Grape 144
Grape-fruit 141
Graphite 104, 113
Grasses 123
Ornamental Lawn . . 156
Grasshopper 237
Great Battles, Historical Outlines . . 312 *et seq.*
Great Britain:
Ayr 464
British Lakes 457
Cambridge 466
Chief Cities 458
Climate 458
Commercial and Industrial Centers, England and Wales 461–462
Edinburgh 462
Educational, Historical and Literary Centers 462
English History . . . 466
English Lake District 457
Geographical Features 455
Government . . 652–662
Historical Outlines . 410
Ireland, Commercial and Industrial . . 462
Irish Rivers and Lakes 457
Islands and Divisions 455
London 458–459
Melrose, and Memorials of Sir Walter Scott 464
Mountains and Lowlands 455
Mountains of 75
Oxford 463
People of 458
Religions of 458
Rivers 456
Scotch Lakes 457
Scotland, Commercial and Industrial . . 462
Sovereigns of . 472 *et seq.*
Stratford-on-Avon . 463
Surface of 455
Thames 456
What It Comprises . 454
Windsor 464–466
Windsor Castle . 464 466
Great Events of History . . . . . 312 *et seq.*
Great Lakes 583
Great Men, Historical Outlines . . 312 *et seq.*
Great Rivers:
Area of Drainage . . 71
Deltas and Estuaries 71
Diagram of 72, 73
Length of 71
Where They Empty . 71
Great Salt Lake . 77, 583
Grebes 218
Greece 372, 555
(See also Greeks.)
Accusation and Death of Socrates 379
Achæan League . . . 382
Age of Pericles . . . 377
Alexander's Invasion of Persia 380
Ancient Divisions of . 372

INDEX

PAGE

Greece—Continued.
Athens 375, 555
Battle of Marathon . 376
Battle of Salamis . . 377
Battle of Thermopylæ 377
Cities 355
Dorian Invasion . . 373
Downfall of Athens . 379
Early Greek Colonization 372
Famous Islands of . 372
Famous Laws of Lycurgus 374
Gallic Invasion of . . 382
Government 555
Greatest Period of Orators 380
Greek Colonies . . . 374
Greek Kingdoms in Asia 381
Greek Thought in Asia 381
Hellenes 372
Historical Outlines . . . . . 433 *et seq.*
History of 373
History of Modern . 555
Land of 372
Laws and Reforms of Solon 375
Laws of Draco . . . 375
Legendary History of 373
Macedonian Period . 380
Minoan Age, The . . 373
Mycenean Age . . . 373
Mythology . . . 820–847
Mythology, Chart 846, 847
Olympiads 375
Peloponnesian War . 377
People 555
Period of Migration . 374
Period of Persian Wars 376
Pre-historic Period . 373
Production and Industry 555
Pyrrhus 382
Retreat of 10,000 Greeks 379
Rivers 555
Roman Province . . 383
Sacred Wars 380
Sparta 374
Surface 555
Under Byzantine Empire 383
Under Foreign Rule until 1832 383
Under Turkish Rule . 383
Usurpations of Pisistratus 375
Greek Words and Phrases 755
Greeks 282, 299, 372
(See Also Greece.)
Alexander's Successors 381
Conquest of Egypt . 347
Empire of Alexander the Great 380
Great Period of Oratory 380
Greek Culture Carried to Rome 393
Historical Outlines . . . . . 312 *et seq.*
History of 373
History of Macedonia 382
Ionians and Dorians . 374
Macedonian Period . 380
Philip of Macedon . 379
Retreat of the 10,000 Greeks 370
Rise of Macedonia . 379
War with Persians . 370
Grosbeaks 214
Grouse 219–220
Guava 167
Guinea 220, 259
Guinea-pig 252
Gulf of Mexico 85
Gulf Stream 88
Gulls 218

PAGE

Gum 162
Gypsies 282
Gypsum 104

H

Haddock 226
Hague, The 557
National Monument of Holland 557
Palace in the Wood . 557
Halibut 227
Halos 101, 102
Hamilcar 390
Hammurabi, Great Period of 354
Hannibal, Causes of His Defeat 390
Defeated by Scipio . 391
Final Fate of 391
Hero of the Second Punic War 390
Hapsburg, Line of . . . 507
Hare 198
Haroun-al-Raschid, Famous Caliph of Bagdad 407
Harvard University 594–595
Hartford 601–602
Architecture of . 601–602
Capital 601–602
Industry of 602
Manufactories and Other Industries . 602
Parks and Public Bridges 602
Trinity College . . . 602
Hawks 209
Health 945
Heat of Sun, How Distributed 90
Heavens, Book of 13 *et seq.*
Hebron 364
Hebrews . . . 282, 297, 358
David 359
Division of Monarchy 360
History of 359
Maccabees 360
Monarchy of 359
Period of the Judges . 359
Saul 359
Solomon 359
Hedgehog 195
Hedge Plants, Description of 155, 156
Hegira 405
Height of Mountains 72, 73, 74, 75, 76
Heliopolis 351
Hellebore 168
Hellenes 372
Hell Gate 87
Hematite 104
Hemispheres and Continents 443
Hemlock 162
Hemp 167
Henbane 168
Henry I., Emperor of Germany 506
Heptarchic Wars . . . 694
Herb Paris 169
Heron 217
Herring 226
Hickory 162
Hieroglyphics 346
Hindus, or Hindoos 283, 297
Hippopotamus 203
Historical Geography 296–309
Maps 296, 298, 300, 302, 304, 306, 308
Known World, B. C. 3800 to B. C. 450 . . . . 296, 297, 298, 299
About B.C. 450 . . . 301
About B.C. 325 . . . 301
About 300 A.D. . . 301
About 500 A.D. 302–303
About 800 A.D. 302–303
About 1000 A.D. 302–303
About 1300 A.D. 302–303
About 1500 A.D. 304–305
About 1600 A.D. 304–305

PAGE

Historical Geography —Continued.
About 1700 A.D. 306–307
About 1800 A.D. 306–307
About 1915 A.D. 308–309
Historical Outlines: (See also under names of individual countries.)
Austria . . . 419 *et seq.*
Austria-Hungary . . . . . 435 *et seq.*
Babylonia . . 312 *et seq.*
Balkans . . . 437 *et seq.*
Belgium . . . 429 *et seq.*
Bohemia . . . 415 *et seq.*
China . . . . 411 *et seq.*
Denmark . . 411 *et seq.*
Eastern or Byzantine Empire . . 411 *et seq.*
Egypt . . . . 312 *et seq.*
Germany . . 410 *et seq.*
Great Battles . 312 *et seq.*
Great Britain . 410 *et seq.*
Great Men . . 312 *et seq.*
Great Periods in Civilization . . . 312 *et seq.*
Great Wars . 312 *et seq.*
Greece, Modern . . . . . 433 *et seq.*
Greeks . . . . 312 *et seq.*
Holland . . . 418 *et seq*
Holy Roman Empire . . . . 414 *et seq.*
Hungary . . . 415 *et seq.*
India . . . . 411 *et seq.*
Italy . . . . 410 *et seq.*
Japan . . . . 411 *et seq.*
Norway . . . 411 *et seq*
Ottoman Empire: . . . . . 419 *et seq.*
Persia . . . . 419 *et seq.*
Poland . . . 415 *et seq.*
Portugal . . . 414 *et seq.*
Prussia . . . 427 *et seq.*
Russia . . . . 415 *et seq.*
Saracens . . . 411 *et seq.*
Scandinavia . 411 *et seq.*
Slavs . . . . 411 *et seq.*
Spain . . . . 410 *et seq.*
Sweden . . . 411 *et seq.*
Switzerland . 415 *et seq.*
United States . 422 *et seq.*
History:
Comparative Outlines . . . . . 312 *et seq.*
Great Events . 312 *et seq.*
Of Argentina 673
Of Austria-Hungary . 534
Of Babylonia 354
Of Belgium . . . 550, 552
Of Brazil 675
Of Canada 669
Of Chile 677
Of Denmark 554
Of Egypt 346
Of England 466
Of France 487
Of Germany 505
Of Greece 373
Of Greece, Modern . 555
Of Holland 557
Of India 687
Of Italy 524
Of Japan 689
Of Mexico 671
Of Norway 559
Of Palestine 359
Of Phœnicia 367
Of Poland 560
Of Portugal 561
Of Roumania 563
Of Russia . . . 545–546
Of Servia 564
Of Spain 566
Of Sweden 568
Of Switzerland . . . 572
Of Turkey 576
Of United States . . . . . 634 *et seq.*
Outlines of Nations . . . . . 312 *et seq.*
What It Is 299
History of England:
Boer War 470

PAGE

History of England —Continued.
Crimean War 469
Elizabethan Period . 498
Final Absorption of India 469
House of Hanover . . 469
House of Lancaster . 467
House of Saxe-Coburg 470
House of Stuart . . . 468
Indian Mutiny . . . 469
Magna Charta . . . 467
Period of Commonwealth 468
Plantagenets 467
Restoration 468
Sovereigns of . 472 *et seq.*
Tudors 467
Victorian Period . . 469
Hohenstaufen Line . . 506
Holland 556
Cities 557
Climate 556
Historical Outlines . . . . . 418 *et seq.*
History 557
People 556
Production and Industry 556
Rivers and Canals . 556
Surface 556
The Hague 557
Holy Land 358
Bethlehem 364
Geography 361
Jerusalem . . . 363, 364
Nazareth 365
Hoofed Animals . . . 199
Hops 167
Horse 252–253
Breeds of 253
Characteristics of Draft Horses . . . 253
Chief Breeds of Draft Horses 253
Noble Character of . 253
Original Home of . . 252
Saddle and Driving . 254
Horse-chestnut 162
House of:
Hanover 469, 475
Lancaster . . . 467, 474
Orleans 491
Romanoff 548
Saxe-Coburg 470
Stuart 468, 475
Tudor 474, 475
Valois 489
York 474
Howling Monkey . . . 192
Huckleberry 145
Hudson River, Description of 582
Human Body . . 925 *et seq.*
Ear 933
Eye 936
How We Are Able to Taste, Smell and Feel 939
Hundred Years' War . 695
Hungary:
Budapest . . . 532–533
Historical Outlines . . . . . 415 *et seq.*
Hurricane 93
Hussite War 695
Hyena 195
Hyperbole 733
Hyphen 732
Hyrcanus, John, Revolt of 361

I

Ibex 202
Ibis 217
Icebergs 97
Ichneumon 195
Iguana 222
Iguazu, Cataracts of . . 82
Independence Hall . . 614
Index, Sign of 733
India:
Absorbed by Great Britain 469

PAGE
India—Continued.
Agra 687
Area and Surface . . 684
Benares 686
Bombay 686
Calcutta 686
Cities 686
Climate 685
Delhi 686
Government 686
Historical Outlines . . . . . 411 *et seq.*
History 687
Languages 685
Peoples 685
Production and Industry 685
Religions 686
Rivers 684
Simla 686
Indianapolis 602
Architecture of . . . 602
Education and Industry 602
Noteworthy Parks . 602
Indian Ocean 84, 85
Indians 283
Indus 684
Insects:
Beetles 232
Straight-winged . . . 236
Interest, Legal Rates of 870
Interrogation Point . . 731
Ionians 374
Iran, or Ancient Persia . 299
Ireland:
Coast of 456
Giant's Causeway . . 456
Rivers and Lakes . . 457
Iron 113
Irony 734
Irrigation:
Assiout Dam 345
Dam at Assiout . . . 345
Of the Nile 344
Rise of 344
Islands:
Coral 58, 59
Famous Italian . . . 511
Map Showing Comparative Size . . . 62
Noted, of Eastern Hemisphere . . . 62
Noted, of Western Hemisphere . . . 62
Of North America . . 578
Volcanic 58
Islands of the World . 58
Israelites 282
(See also Hebrews, Jews.)
Captivity of 360
Enter Land of Canaan 359
Exodus under Moses 359
In Egypt 359
Italian Peninsula:
Important Early Divisions 385
Mountains and Rivers 385
Italian Words and Phrases 742
Italy 511
(See also Italian.)
Agriculture and Stock-raising . . . 513
Apennines 511
Chief Cities 513
Climatic and Landscape Features . . 512
Conquests of Lombards 404
Conquest of Papal States 525
Difficulties of Consolidation 525–527
Education 513
Florence 519
Genoa 520
Historical Outlines . 410
History of 524
Influence of Napoleon 525
Islands and Their Surface 511
Kingdom of 511
Lake Como 512

PAGE
Italy—Continued.
Lake Garda 512
Lake of Lugano . . . 512
Lake of Maggiore . . 512
Lakes of 512
Lombards 524
Manufactories of . . 513
Mediæval 525
Milan 520
Minerals of 513
Mountains and General Configuration . 511
Naples 520–521
Palermo 522
People and Language 513
Pompeii, Ruins of . . 521
Port of the Holy Roman Empire . . 524
Present Kindgom Established 525
Products and Industries 513
Religion 513
Rise of Papal Power . 524
Rivers and Coast Waters 511
Riviera 512–513
Rome 513
Seaports of 524
Sorrento 522
Struggle for Independent Nationality . 525
Turin 522
Venice 523

J

Jackal 195
Jade 110
Jaffa 367
Jaguar 195
Japan 687
Area and Population 687
Cities 689
Climate 688
Government 688
Historical Outlines . . . . . 411 *et seq.*
History 689
Lakes and Rivers . . 688
People 688
Production and Industry 688
Surface 688
Tokio 689
Yokohama 689
Japanese 285
Jasper 110
Jays 214
Jericho 365
Jerusalem 358, 363
Captured by Pompey 361
Destroyed by Titus . 361
Historic Features . . 364
Streets and Quarters of 364
Wall of 364
Way of the Cross . . 364
Jewish War 694
Jews 282
Joan of Arc 489
Johns Hopkins University 591
Johnson Grass 126
Jordan, River of . 77, 362
Juanacatlan, Falls of . 82
Judas Tree 162
Judgments 875
Jugurthine War 693
Jungfrau 56
Juniper Tree 164
Justinian, Notable Reign and Service of . . 404
Wars of 694
Jute 167

K

Kale 130
Kaolin 103
Kangaroo 204
Katydid 237
Khufu, King of Egypt . 346
Kieff, Russia 545

PAGE
Kingdoms of Nature, Vegetable Kingdom . . . . . 119 *et seq.*
Koala 204
Koblenz (Coblence) . . 450
Koran, The 405

L

Ladybug 234
Lake:
Champlain . . . 76, 584
Como 76, 512
Erie 583
Garda 512
George 76
Huron 583
Lucerne 76
Lugano . . . 76, 77, 512
Maggiore . . . 76, 512
Merom 362
Michigan 583
Ontario 583
Superior 583
Lakes:
Distribution of . . . 77
Famous Italian . . . 512
Famous Salt 77
Fresh-water, of the World . . . 76, 79, 80
In Plains 77
Mountain 76
Of Africa 80
Of Asia 77
Of Egypt 344
Of Europe 77
Of Japan 688
Of North America . . 77
Of United States . 583
Relative Size . . . 78, 79
Salt 76, 78
Salt, Area of 75
Salt, Location of . . 78
Land Measure 858
Language and Literature . . . . 712 *et seq.*
Languages:
(See also under Countries.)
Ancient 755
French Words and Phrases 742
German Words and Phrases 742
Greek Words and Phrases 755
Italian Words and Phrases 742
Latin Words and Phrases 755
Modern Foreign . . 742
Number Spoken . . 442
Of India 685
Principal of World . 442
Spanish Words and Phrases 742
Lapis-lazuli 110
Larch 164
Lark 214
Latin Words and Phrases 755
Latins or Romans . . . 287
Lawn Grasses . . 156, 157
Laws:
Commercial 875
Concerning Notes and Accounts 875
Exemption 875
Interest 875
Legal Interest . . . 875
Statutes of Limitation 875
Usury 875
Lead 104, 113
Leaders 733
Leap Year 865
Leeches 242–243
Leipzig 503
Leland Stanford, Jr., University 620
Lemmings 199
Lemon 141
Length, Measures of . . 857
Lentils 130
Leopard 195

PAGE
Letter Writing 734
Acceptance 736
Ceremonial Letters and Notes 736
Divisions of a Letter 734
Invitations 736
Official and Titled Salutations 737
Official or Business Letters 735
Personal and Social Letters 735
Style of Letters . . . 735
Writing Materials . . 736
Lettuce 130
Lick Observatory . . . 620
Licorice 167
Lighting 101
Lily 148
Limes 141
Lime Tree 164
Lincoln, Abraham . . . 642
Assassination of . . . 644
Linden or Lime 164
Lion 195
Liquid Measures . . . 860
Lisbon 561
Literary Allusions, 782 *et seq.*
Literature 761
American Literature . 775
Books as Liberal Educators 762
Brain of Humanity 761–762
Characters in . 782 *et seq.*
English 762
Famous Book, 782 *et seq.*
Famous Poems and Dramas . . 782 *et seq.*
How It Has Created New Worlds and People 761
How It Helps Us Interpret Life . . 761
Literary Allusions . . . . . 782 *et seq.*
Literary Geography . . . . . 782 *et seq.*
Pen Names of Famous Writers . . 782 *et seq.*
Plots and Scenes . . . . . 782 *et seq.*
References to . 782 *et seq.*
Rise of Roman . . . 393
Soubriquets and Nicknames . 782 *et seq.*
Vast Range of . . . 761
Why We Study Literature 761
Lithium 113
Lizards 221
Llama 254
Lobster 231
Locust Tree 164
Locusts 237
Lombards in Italy . . 404
London 458, 459
Art Galleries and Museums 461
Famous Churches . . 460
Famous Streets and Bridges 459
General Features 458, 459
Monuments and Public Buildings . . . 460
Parks and Squares . 460
Places of Amusement 461
Population of 461
Westminster Abbey . 460
Long Measure 856
Longitude and Time . . 864
Lorelei (Lurlie) 451
Los Angeles . . . 602–603
Buildings of Note . . 603
Climate 603
Industries of 603
Parks and Public Places of Importance 603
People of 603
Public Library . . . 603
Streets and Business Thoroughfares, 602, 603
University of Southern California 603

INDEX

PAGE

Louis IX., King of France 488
Louis XIV., King of France 490
Louisville 603
Chief Buildings of Note 603
Educational and Industrial 603
Public Parks 603
Lucerne, Lake 76
Lugano, Lake 76
Lung-Fishes . . . 228–229
Luxemburg, House of . 507
Lycurgus, Laws of . . 374
Lydia 369
Lyric Poetry 740

M

Maccabees 360
Macedon:
Later History of . . 382
Rise of 379
Under Philip 379
Macedonian Wars . . . 693
Mackerel 226
Madrid 565
Royal Palace 565
Maelstrom 87
Maggiore, Lake 76
Magi, The 371
Magna Charta 467
Magnesium 113
Magnetite 104
Mahogany 164
Mainz 452
Malays 287
Mammals 191
Mammoth Cave . . . 584
Man:
Ape-man of Java . . 269
Cro-magnon Man . . 269
Development through the Ages 273
First Migrations of . 268
In the Stone Age . . 270
Neanderthal Man . . 269
Piltdown Man . . . 269
Prehistoric . . . 267–275
Primeval Home of . 268
Man and the Human Family 267
Mango 141
Manhattan Island . . . 607
Maple 164
Maps:
Distribution of Animal Life 188
Distribution of Plant Life 120
Panama Canal and Connections . . . 649
Marathon, Battle of . . 376
Marius and Sulla, Civil War between . . . 394
Markhor 202
Marmoset 192
Marmot 199
Marten 196
Marsh Crow's Foot . . 169
Marsian or Social War 693
Martynias 170, 171
Massachusetts Institute of Technology 594–595
Mate or Paraguay Tea 141
Matterhorn 56
Mayence (Mainz) . . . 452
Meadow Saffron . . . 169
Measures—See Weights and Measures.
Mecca 405
Medes 297, 368
Cyaxares 369
Origin and Character 369
Media:
Founded by Cyaxares 369
Medical Signs and Abbreviations 864
Medina 405
Mediterranean and Its Arms 444
Mediterranean Regions (Map) 298

PAGE

Mediterranean Sea . . 85
Medo-Persian Empire . 368
Meerschaum 113
Melon 130
Melrose 464
Memphis, Egypt . . . 352
Mercury 113
Merovingians . . . 487, 493
Mesquite 164
Messenian Wars . . . 692
Metaphor 733
Metonymy 734
Metre, In Poetry . . . 740
Metropolitan Museum . 612
Mexican War . . . 640, 641
Causes and Results of 641
Commanders 641
Principal Battles . . 641
Troops Engaged . . 641
Mexico 669
Cities 671
Climate and Landscape 669
Government 670
Gulf of 85
History 671
Mexico City 671
People 670
Production and Industry 670
Rivers and Lakes . . 669
Surface 669
Mexico City 671
Cathedral 671
Description of . . . 671
Mica 106, 114
Mice 199
Middle Ages 403
Nature of Period . . 404
Milky Way 32
Millet 126
Milwaukee 603, 604
Business District . . 604
Chief Buildings . . . 604
Industries and Manufacturing 604
Public Places of Interest 604
Streets of 604
Minerals:
Crystallization of . . 103
Dictionary of 103
Rare Metals 115
Scale of Hardness . . 103
Table for Identification of 104, 105, 106, 107
Useful, of the Earth . 102
Mink 196
Minneapolis 604
Chief Products . . . 605
Chief Streets—Business and Residential 604
Notable Institutions of 604
University of Minnesota 604
Minoan Age, The . . . 373
Mirage 102
Mistletoe 174
Mists 94
Mithridates, Designs against Rome . . 394
Mithridatic Wars . . . 693
Mockingbird 214
Modern Languages . . 742
Mohammed 405
Mohammedanism:
Characteristics of . . 405
Rise of 405
Mohammedans, Conquest of Egypt . . 348
Mole 196
Molluscs 229
Money:
English or Sterling . 869
French 869, 870
Of Germany 870
Of United States . . 869
Mongolians 288
Mongoose 197
Monkey Tribe . . 191–194
Monk's-hood 169
Monte Rosa 56

PAGE

Months, Names of . . 868
Moon:
Effect upon the Tides 86
Phases of 19
Surface of 29
Moonstone 110
Moors 288
Mormon Temple and Tabernacle 617
Moscow 544–545
Burned in 1812 . . . 294
Noted Buildings and Monuments . . . 545
Moses, In Egypt . . . 359
Moslems 405
Mosquito 240
Moths 236
Mount Ararat 57
Mount Assiniboine . . 57
Mount Blanc 56
Mount Elburz 56
Mount Everest 56
Mount Nebo 361
Mount of Olives . . . 364
Mount Popocatepetl . . 57
Mount Ranier 57
Mount Robson 57
Mount St. Elias . . . 57
Mount Salcantay . . . 57
Mount Sinai . 56, 361, 362
Mount Tabor 361
Mount Vernon, Home of George Washington 627
Mount Zion 364
Mountain Lion 197
Mountains:
Alpine Region . . . 445
Celebrated Peaks . 56, 57
Famous 72, 73
Height of, 72, 73, 74, 75, 76
Name and Location of 74, 75, 76
Of British Isles . . . 75
Of Europe 445
Of France . . . 445, 447
Of Great Britain . . 445
Of Italy 446, 511
Scandinavian 446
The Caucasus . . . 446
Mountains and Plains:
Of United States . . 580
The Urals 446
Mouse Tower 452
Mulberry 141
Mushroom 130
Musk-ox 202
Mycenean Age 373
Mythology:
Assyrian Gods . . . 357
Babylonian Gods . . 357
Charts of . . . 846, 847
Dictionary of . . 820–847
Egyptian Gods . . . 348
Greek and Roman 820–847
Legendary History of Greece 373
Of Constellations . . 36
Oriental 820–847
Phœnician Gods . . 368
Scandinavian . . 820–847

N

Names of Days 868
Of Months 868
Napoleon Bonaparte . 491
Napoleon at the Burning of Moscow . . 294
Napoleonic Wars . . . 697
Narration 738
Narwhal 207
Nashville 605
Educational Center . 605
Manufactures . . . 605
Prominent Buildings . 605
Vanderbilt University 605
Nasturtium 149
National Military Cemetery (Arlington) . 626
Nations of the World . . . . . 442 *et seq.*
(See also Countries.)

PAGE

Nations:
Ancient Extinct . 297, 299
Comparative History . . . . . 312 *et seq.*
Extinct Nations of the Past . . 295 *et seq.*
Forms of Government 442
(See also under Individual Countries.)
Great Historic Periods of . . . . . 312 *et seq.*
Living Nations of Today . . . . 295 *et seq.*
Wealth of 443
Natural Bridge of Virginia 586
Nazareth 365
Nebuchadnezzar, Famous Reign of 356
Negroes 288, 289
Nepenthes 171
Nerves:
Of Hearing 934
Of Sight 938
Of Taste, Smell and Touch 939
Netherlands—See Holland 556
Netherlands or Holland, Historical Outlines . . . . . 418 *et seq.*
War of Liberation . . 696
New England Conservatory of Music . 594
New Haven 605
Description of . . . 605
History of . . . 605, 606
Industries 605
Location and Surroundings . . 605–606
Parks and Squares . 605
Yale University . 605–606
New Orleans:
Chief Buildings . . . 606
Description of . . . 606
French Quarter . . . 606
History 607
Public Statues . . . 606
Streets and Parks . . 606
Trade and Industries 606, 607
Newport, R. I.:
Chief Attractions . . 607
Description of . . . 607
History of 607
New York City:
Bridges 608
Broadway . . . 608–611
Cathedral of St. John the Divine 612
Central Park 611
City Hall 610
Colleges and Other Institutions 608 *et seq.*
Columbia University 612
Court House 610
Districts and Streets 608
Fifth Avenue . 611 *et seq.*
Grant's Tomb . 612, 613
History of . . . 612, 613
Location and Environs 607
Manhattan 607
Metropolitan Museum 612
Parks and Squares . 608
Public Architecture . . 608, 609, 610, 611, 612
Public Library, 608 *et seq.*
Public Statues and Fountains . 608 *et seq.*
Riverside Drive . . . 612
St. Patrick's Cathedral 611
Systems of Communication 608
New York Harbor . . 607
News, How to Write . 738
Newts 224
Niagara Falls, 80, 81, 82, 585
In Winter 81
Nickel 114
Nightingale 214
Nile, The 343
Annual Overflow . . 344

PAGE
Nile, The—Continued.
Assuan Dam 345
Cataracts of 80
Dam at Assiout . . 345
Irrigation System of . 344
Valley of 343, 344
Ninevah 355
Norman Conquest, 466, 594
Norman Kings of England 473
Normans, Period of Norman-French Literature . . . 763, 769, 770
North America:
Canada 666
Climate 579
Coast-line 578
Countries of 443
Famous Mountains of 74
Islands of 578
Lakes of 77
Mexico 669
Political Divisions . . 579
Position and Extent . 578
Rivers and Lakes . . 578
Surface 578
United States 579
North Sea 86
Northern War 696
Northmen, Invasions of 694
Norway 558
Christiania 559
Cities 559
Government of . . . 559
Historical Outlines . . . . . 411 *et seq.*
History 559
People 558
Production and Industry 558
Rivers 558
Notes, Commercial . . 870
Novel, Rise of, in English Literature . . 766
Numa, King of Rome . 386
Number Table 870
Nutmeg 141

O

Oak 164
Oats 126
Oases, of Egypt 344
Oceania, Famous Mountains 75–76
Ocean:
Baltic Sea 86
Color of 86
Currents of 88
Depth of 85
Floor of 85
Gulf of Mexico . . . 85
Inland and Border Waters 85
Mediterranean Sea . 85
Oceans of the World . 84
Red Sea 85
System of Currents . 88
Temperature 86
Tides 86
Waves 88
Ocelot 197
Octopus 229
Odontoglossum 149
Okapi 202
Okra 130
Olive 141
Olympiads 375
Onion 131
Onomatopœia 734
Onyx 110
Opal 110
Opossum 205
Orange 141
Orang-outan 194
Orchard Grass 126
Organs, of Speech . . . 712
Oriental Mythology 820–847
Orioles 215
Orleans, House of . . . 494
Osage Orange 164
Osprey 210
Ostrich . . . 210, 219, 259

PAGE
Ottawa, Description of City 668
Otter 197
Otto the Great 506
Ottoman Empire—See Turkey 572
Historical Outlines . . . . . 419 *et seq.*
Ottomans 292
Owls 210
Oxford 463
Oyster 229

P

Pachyderms 203
Pacific Islands, Famous Mountains of . . 75, 76
Pacific Ocean 84
Pagodas, of China . . . 680
Painting, Egyptian . . 349
Palestine 358
Babylonian Captivity 360
Bethlehem 364
Cana of Galilee . . . 364
Captivity of Israel . 360
Conquered by Rome 361
David 359
Division of Hebrew Monarchy 360
Fall of Judah 360
Geography of 361
Hebrew Monarchy . 359
Hebron 364
History 359
Jaffa 337
Jericho 365
Jerusalem . . . 363, 364
Judah, or Judea, Subject to Persia . . . 360
Judges 359
Maccabees 360
Mountains 361
Nazareth 365
Philistines 359
Return of Hebrews to Jerusalem 360
Saul 359
Situation and Importance 358
Solomon 359
Towns of 363
Palm Family 165
Palms 142
Palmyra 366
Palo Alto 620
Panama Canal, Map of 649
Panama-Pacific Exposition 619
Pangolin 204
Paper Measure 870
Papering 858
Paragraph, Sign of . . 733
Parallels 733
Parentheses 732
Paris 478
Arch of Triumph . . 480
Cathedrals and Churches 481
Center of Parisian Life 479
Eiffel Tower 483
Environs and Fortifications 479
Grand Opera House . 482
Hotel des Invalides . 482
Industries of 482
Latin Quarter and Its Institutions . . . 482
Madeleine, Church of 479
Palace of Justice . . 481
Palaces and Public Buildings 481
Panorama of . . 484–485
Pantheon 481
Seine and Its Bridges 478
Squares and Parks . 479
Stairway of Honor, Grand Opera House 483
Streets and Boulevards 479
Theaters and Places of Amusement . . 482
Trocadero Palace . . 480

PAGE
Parrots 212, 259
Parsnip 131
Parthenon 378
Parthia 396
Partridges 220
Patricians and Plebeians 387
Pea 131
Peach 142
Peacock . . . 211, 220, 259
Pear 142
Pearl 110
Pecan 142
Peking:
Description of . . . 682
Royal Observatory . 682
Pelican 219
Peloponnesian War, 377, 692
Penguin 219
Peoples:
(See also Races and Peoples.)
Of Argentina 673
Of Brazil 674
Of Canada 667
Of Chile 676
Of China 681
Of Denmark 553
Of Holland 556
Of India 685
Of Japan 688
Of Mexico 670
Of Norway 558
Of Poland 559
Of Portugal 561
Of Roumania 512
Of Servia 563
Of Spain 564
Of Sweden 567
Of Switzerland . . . 571
Of Turkey 574
Of United States . . 293
Pepper Plant 145
Peppers 131
Perch 226
Pericles:
Age of 377
His Great Achievements 377
Period, The 731
Perpetual Calendar . . 867
Persepolis 371
Persia 368
(See also Persians.)
Artaxerxes 370
Arts and Sciences of . 371
Cambyses 369
Cities of 371
Conquest of Egypt . 347
Conquest of Judea . 360
Court Life in 371
Darius III. 371
Great Reign of Darius 370
Historical Outlines . . . . . 419 *et seq.*
Location and Extent 368
Magi 371
Palaces and Tombs of 371
Persian Life 371
Religion 371
Retreat of the 10,000 Greeks 370
War with the Greeks 370
Xerxes 370
Persian Empire:
(See Persia, Persians.)
Founded by Cyrus . 369
Persian Wars . . . 376, 692
Persians 289, 297
Origin and Character 369
Relation to the Medes 369
Persimmon 142
Personification 733
Peter the Great 546
Petit Trianon 486
Petra 365
Rock-hewn Temples . 366
Temples of 365
Petrograd 541–542
Famous Buildings and Monuments . 543–544
Petroleum 114
Petsal 129
Phalanger, Flying . . . 205
Pharsalia, Battle . . . 397
Pheasants 220

PAGE
Philadelphia 613
City Hall 613
Colleges and Other Institutions . . . 614
Description of . . . 613
Fairmount Park . . 615
History of 615
Independence Hall . 614
Public Statues, 613 *et seq.*
Streets and Parks . . . . . 613 *et seq.*
University of Pennsylvania 615
Philip of Macedon . . . 379
Philistines 359
Phillipi, Battle of . . . 398
Phillipine Weights and Measures 870
Phœnicia 367
(See also Phœnicians.)
Arts of 368
Civilization of . . . 368
Government 367
Great Cities of . . . 367
History of 367
Sidon 367
Tyre 367
Vast Commerce of . 368
Phœnicians 297, 367
(See also Phœnicia.)
Found Carthage . . 367
Origin of Alphabet . 368
Religion 368
Physiology 871
Pig (See also Swine.) . . 255
Pig, Wild 204
Pigeon 259
Pike, Bony 228
Pike's Peak 56
Pine 164
Pine-apple 145
Pisistratus, Usurpations of 375
Pistacia 145
Pitcher Plants, 169, 170, 171
Pittsburgh:
Chief Streets and Parks 615
Description of . . . 615
History of 616
Manufactures and Industries 616
Public Buildings and Institutions . . . 615
Plane Tree 165
Planets . . . . 13 *et seq.*
Plant Kingdom:
Chief Divisions of . . 122
Commercial Plants . 166
Cruel Plants 169
Cryptogams or Flowerless Plants . . . 158
Desirable Vines . 154, 155
Fiber Plants 166
Flowering Shrubs 155, 156
Flying Seeds 173
Fruit-bearing Plants and Shrubs 142
Fruit Trees 136
Hedge Plants . . 155, 156
How Plants Defend Themselves . . . 174
How Plants Protect Their Flowers . . 173
How Plants Travel . 172
Nature's Aviators and Seed-sowers . . . 172
Parasites 174
Plant that Grows in the Snow 174
Plants that Entrap and Kill Animals . 170
Poisonous Plants . . 168
Some Wonders of . . 169
Trees of the Forest . 160
Uses of Liquid Rubber 174
Wild Flowers 157
Plant Life:
(See also Plant Kingdom.)
In Cold Zones . . . 122
In Temperate Zones . 121
In the Tropics . . . 121
Map Showing Distribution 120

INDEX

PAGE

Plantagenet Kings of England . . . 473, 474
Plants and Plant Life . . . . . 119 *et seq.*
Platinum 114
Plovers 217
Plum 142
Poems and Dramas . . . . . 782 *et seq.*
Poetics 739
  Didactic Verse . . . 740
  Dramatic 740
  Epic 739
  Forms of 734
  Lyric 740
  Metre 740
  Poetic Feet 740
  Stanzas 741
  Verse 740
Poisonous Plants . . . 168
Poland 559
  Cities 560
  Historical Outlines . . . . . 415 *et seq.*
  History 560
  People 559
  Surface 559
  Warsaw 560
Polar Bear 194
Pollack 227
Pomegranate 142
Pompeii 521
Pompey 395
  Death at Battle of Pharsalia 397
  Military Expeditions of 395
  Rivalry with Cæsar . 396
  Struggle with Cæsar . 396
Poplar 165
  Trembling 160
Porcupine 199
Porgy 226
Porpoise 207
Portugal 560
  Cities 561
  Government 561
  Historical Outlines . . . . . 414 *et seq.*
  History 561
  Lisbon 561
  People 561
  Production and Industry 561
  Surface and Climate . 560
Potato 131
Potsdam 501
Pouched Animals . . . 204
Powers of Europe . . . 548
Prague 531–532
Prairie Dog 199
Prairie Wolf 198
Prawn 231
Precious Stones 109
Presidents of France . . 493
Presidents of the United States:
  (See also under United States Government.)
  Birth and Parentage . 662
  Career after Leaving the Presidency 664–665
  Death and Place of Burial 665
  Education, Profession, Religion and Politics 663
  Election to the Presidency 664
  Marriage and Children 664
  Powers of 652
  Sobriquets of . . 664–665
  Term of Office . . . 665
  Writings of . . . 664–665
Pronunciation:
  Common Errors in . 715
  Rules of 714
Prose, Forms of 734
Prussia, Historical Outlines . . . . 427 *et seq.*
Psametik 347
Ptarmigan 220
Ptolemies, The 347
Puberty, Problems of . 964

PAGE

Public Lands, of United States 587
Punctuation:
  Apostrophe 733
  Asterisk 733
  Asterism 733
  Brace 733
  Brackets 732
  Colon 731
  Comma 731
  Dagger 733
  Dash 732
  Ellipsis 733
  Exclamation Point . 731
  Hyphen 732
  Index Sign 733
  Interrogation Point . 731
  Leaders 733
  Parallels 733
  Parenthes s 732
  Period 731
  Section Mark 733
  Semicolon 731
  S gn of Paragraph . . 733
Punic War, First . . . 693
  Second 693
  Third 693
Punic Wars 389
Puritans:
  Influence on English Literature 766
  Period in English Literature . 764–765
Pyramid Builders . . . 346
Pyramids . . 342, 350, 351
  Sectional View of . . 351
Pyrenees 446
Pyrites 106
Pyrrhus, King of Epi us 382
  War with Rome . . 388

Q

Quail 220
Quirinal Palace, Rome . 516

R

Rabbit 199, 254
Raccoon 197
Races and Peoples:
  Comparative Classification 293
  Estimated Population of 293
  Geographical Distribution of . . . 275, 276
  How Classified . . . 274
  Man and the Human Family 267
  Physical and Mental Characteristics of . 275
  Population of the Earth by 442
  Represented in United States 293
  Types of Womankind 266
Radcliffe College . . . 594
Radioactivity 848
Radish 131
Radium, Atoms of . . 848
Rainbows 101, 102
Rainfall 99
Rameses, Epoch of . . 347
Ramie 168
Rape 126
Raphia 168
Rapids 80
Rare Metals 115
Raspberry 147
Rat 199
Rattan 168
Ray 228
Red Sea 85
Redtop 126
Redwood 165
Reichenbach, Falls of . 83
Reindeer 254
Religion:
  (See also under Countries of the World.)
  Assyrian 357

PAGE

Religion—Continued.
  Babylonian 357
  Chief Religions of the World 442
  Egyptian Doctrine of Future Life . . . 349
  Egyptian Gods . . . 348
  Historical Events of Church . . 411 *et seq.*
  Mohammedanism . . 405
  Of Egypt 348
  Persian 371
  Phœnician 368
  Religions of India . . 686
  Religious Population of the World . . . 442
  The Koran 405
Religious Wars in France 696
Reptiles 220
  Alligators 221
  Chameleons 222
  Crocodiles 221
  Flying Dragon . . . 222
  Gecko 222
  Iguana 222
  Lizards 221
  Snakes 222
  Tortoises 220
  Turtles 220
Restoration 491
  English Literature under 766–771
Revolution, American . 635
Revolution of the Earth 91
Rhea 219
Rhetoric 733
Rhine, The 447
  Castles of 447
  Description of, 447 *et seq.*
  Falls at Schaffhausen 81
  Panoramic View of . . . . . 448 *et seq.*
Rhinoceros 203
Rice 126
Richmond, Va. 616
  Capitol 616
  Description of . . . 616
  Historic Buildings . . 616
  Historic Cemeteries . 616
  History of 616
  Public Statues . . . 616
Rivers and Lakes:
  (See also under Countries, Continents, and individuals names.)
  Deltas of 71
  Estuaries of 71
  Euphrates 353
  Great, of World . . . 71
  Heads of 72, 73
  Jordan 77
  Nile 343
  Of Argentina 672
  Of Brazil 674
  Of China 678
  Of Europe 447
  Of Germany . . 495–496
  Of Great Britain . . 456
  Of India 684
  Of Italy 511
  Of Mexico 669
  Of North America . . 378
  Of United States . . 581
  Picture Diagram of, 72, 73
  Rhine 447
  The Danube 453
  Tigris 353
Riverside Drive, New York 612
Riviera 512–513
Roads:
  Appian Way 389
  Great Roman 389
Robin 215
Rocks:
  How Found . . . 44, 45
  Why They Contain Animal and Plant Fossils 46
Rodents 198
Roman:
  (See also Romans and Rome.)

PAGE

Roman—Continued.
  Chronology and Facts about Emperors 401, 402
  Civil War . . . 693, 694
  Forum 400
  Government 389
  Law 387
  Mythology . . . 820–847
  Mythology Chart, 846, 847
  War with Tarentum . 693
Romans 287, 299
  History of 386
Romanoff, House of . . 348
Romanticism:
  Early Nineteenth Century 768
  Period in English Literature, 767, 771, 772
Rome 513
  (See also Roman, Romans.)
  Ancient Roman Forum 400
  Appian Way 518
  Aqueducts of 400
  Arch of Constantine . 515
  Arch of Septimius Severus 515
  Architecture, Ancient and Modern . . . 515
  As a Literary Center under Augustus . . 400
  As a Republic . . . 389
  Assassination of Cæsar 397
  Battle of Pharsalia . 397
  Battle of Philippi . . 398
  Cæsar Dictator . . . 396
  Capital City of the Empire 399
  Capitoline Museum . 517
  City in the Time of Augustus 399
  Coliseum 516
  Compared with Athens 400
  Conquest of Egypt 347, 398
  Conquest of the East by Cæsar 397
  Conquest of the Greek States 391
  Conquest of Italy . . 388
  Conquest of Palestine 361
  Conquest of Sardinia, Corsica and Gaul . 390
  Conspiracy of Catiline 395
  Construction of the Great Roman Roads 389
  Contributions to the World 403
  Crossing of the Rubicon 396
  Destruction of Carthage 391
  Division of the Roman World . . 398
  Early Inhabitants of Sicily 385
  Epoch of the Civil Wars 394
  Epoch of the Punic Wars 389
  Establishment of Democracy 388
  Fall of Western Empire 403
  Famous Churches 517–518
  Famous Struggles of the Factions . . . 395
  First Defeat by the Germans 400
  First Great Code of Law 387
  First Triumvirate . . 395
  Gracchi 394
  Grandeur After Her Foreign Conquests 391
  Great Public Works of 393
  Growth of Political and Social Corruption 392

PAGE

Rome—Continued.
History of Romans . 386
How Governed under the Empire 399
Influence of Greek Culture 393
King Numa and Other Legendary Kings . 386
Marius and Sulla . . 394
Mediæval 514
Military Expeditions in Asia 391
Modern Features and Districts 514
Mountains and Rivers of Italy 385
Mythical Period . . 386
New Rome Contrasted with the Old 393
Origin of Provincial Government . . . 391
Palaces and Art Collections 516
Palaces of Emperors . 516
Panoramic View from St. Peter's Cathedral 510
Pantheon 517
Period of Constantine 403
Pompey, Cicero, Crassus, Cæsar and Catiline 395
Punic Wars 391
Quirinal Palace . . . 516
Reduces Greece to a Roman Province . 383
Rise of Native Literature 393
Rise of Pompey . . . 395
Rivalry of Cæsar and Pompey 396
Roads, Famous . . . 518
Roman Forum . . . 515
Roman World Succeeded by the Germanic 403
Seven Hills 513
Situation of Italian Peninsula 385
Splendors of a Festal Day 392
Struggle Between Patricians and Plebeians 387
Subjugation of Macedon 391
Summary of Roman Government . . . 389
Table of Emperors . 401
Temple of Janus . . 400
Under Augustus . . 399
Vatican 516
View of Monument to Victor Emmanuel II. 526
Villa Medici 516
Villa Umberto Primo 516
War with Pyrrhus . . 388
Rorqual 207
Rose Culture 149
Roses 149
Desirable Varieties of 149
Rosetta Stone 346
Roumania 562
Bucharest 562
Cities 562
Government 562
History 562
People 562
Production and Industry 562
Rivers 562
Surface 562
Rubicon, Crossing of, by Cæsar 396
Ruby 112
Rumania 562
(See Roumania.)
Rurik, House of 547
Russia:
Agriculture and Forests 540
Alexander II. 546

PAGE

Russia—Continued.
Burning of Moscow in 1812 294
Cities and Towns . . 541
Climate of 540
Divisions of . . . 537–539
Duma 547
Early Traditions . . 545
Education 541
Eighteenth Century . 546
Historical Outlines . . . . . 415 *et seq.*
History of . . . 545–546
House of Romanoff Established . . . 546
House of Rurik . . . 547
Ivan III. Expels the Tartars 546
Kieff, the First Historic Center . . . 545
Lake District of . . 540
Live Stock and Fisheries 541
Moscow 544–545
Napoleonic Period . 546
Petrograd . . . 541–542
Products and Industries 540
Reactionary Reign of Alexander III. . . 547
Religion of 541
Rise of Nihilism . . 547
Rivers of 540
Russo-Turkish War . 547
Seaboard and Islands 540
Settlements in and about Moscow . . 545
Sovereigns of . . 547, 548
Surface Features . . 539
Tartar Invasion . . . 545
Turkish Wars . . . 546
Under Peter the Great 546
Vladivostok 545
Russian Empire. . . . 537
(See also Russia.)
Russo-Japanese War . 698
Russo-Turkish War . . 698
Rye 127

S

Sable 197
Sacred Wars of Greece 380
Sahara 99
Saint Denis 483
Saint Lawrence River, Description of . . 582
Saint Louis 621
Eads Bridge 622
History 622
Public Buildings and Monuments . . . 621
Situation and Description . . 621 *et seq.*
Streets and Parks . . 621
Trade and Industry . 622
Washington University 621, 622
Saint Patrick's Cathedral 611
Saint Paul, Minn. . . . 622
Chief Buildings and Institutions . 622, 623
History of 623
Roman Catholic Cathedral 622
Situation and Description 622
Streets, Parks and Public Monuments 622, 623
Trade and Manufactures 623
Saint Sophia Mosque . 574
Salamander 224
Salamis, Battle of . . . 377
Salaries of Rulers or Heads of Countries 443
Salmon 227
Salt 115, 116
Salt Lake City:
Location and Description 617

PAGE

Salt Lake City—Con.
Mormon Tabernacle and Temple . . . 617
Streets, Public Buildings, and Parks . . 617
Temple Block . . . 617
Trade and Industries 617
Salzburg 532
Salzkammergut 533
Sambur 202
Samnite Wars 693
San Antonio 617
History of 618
Location and Description 617
Spanish Missions . . 617
The Alamo 617
Sandalwood 165
San Francisco 618
Chief Streets, Buildings and Parks . . . . . 618 *et seq.*
Chinese Quarter . . 620
Colleges and Other Institutions . . . 620
Earthquake and Fire in 1906 618
Golden Gate Park . . 620
History 620
Location and Description 618
Nob Hill 619
Panama-Pacific Exposition 619
Public Statues and Monuments . . . 619
Trade and Industries 620
Santiago 676
Sapphire 112
Saracen Empire 405
(See also Saracens.)
Conquests of 406
Division of 406
In Northern Africa . 406
Subjugation of Spain 406
Saracenias 171
Saracens 405
(See also Saracen Empire.)
Caliphate at Bagdad 407
Capital at Bagdad . 407
Contributions to Art and Learning . . . 407
Defeated by Charles Martel 406
Historical Outlines . . . . . 411 *et seq.*
Saracen Wars 694
Sardine 227
Sardis 371
Sargon, of Assyria . . . 356
Sassafras 165
Saturn, Rings of . . . 17
Saul 359
Sawfish 228
Saxon Kings of England 473
Scallop 229
Scandinavia, Historical Outlines . . 411 *et seq.*
Scandinavian Mythology 820–847
Scarabæus 234
Schaffhausen, Falls at . 81
Schmalkaldic War . . . 695
Science 850
Arithmetic . . 850 *et seq.*
Basis of 850
Books of the Earth . . . . . 40 *et seq.*
Book of the Heavens, 12-38
Geology of the Earth 48, 49
Methods of 850
Scientific Terms Concerning Animals 263, 264
Science and Invention . 850
Scientific Terms:
Botanical Classification of Plants . 182, 183, 184, 185, 186
Concerning Animals 263, 264
Used in Botany 176, 177, 178, 179, 180, 181, 182

PAGE

Scientific Terms—Con.
Used in Earth Sciences 117
Scipio Africanus . . . 391
Scorpions 231
Scotch Lakes 457
Sea:
Aral 77
Caspian 77
Dead 77
Of Galilee . . . 362, 363
Of Tiberias 362
Sea Cucumbers 242
Sea Lilies 242
Sea Lion 206
Seal 205
Seasons:
Causes of 91
In Different Latitudes 92
Seattle 620
History of 621
Situation and Description 620
Streets and Buildings 621
Trade and Industry . 621
University of Washington 621
Sea Urchins 242
Sea-water:
Chemistry of 86
Salt in 86
Section Mark 73
Seleucidæ 381
Semicolon 731
Sepoy Mutiny 697
Sequoia 165
Serbia—(See Servia) . . 563
Servia 563
Cities 563
Government 563
History 564
People 563
Production and Industry 563
Surface 563
Seven Years' War . . . 696
Shad 227
Shaddock 141
Shakespeare, Place in English Literature . 765
Sharks 228
Sheep 254, 255
Shepherd Kings 346
Shrew 197
Shrimps 231
Shrubs and Plants, Fruit-bearing . . . 142
Sicily, Early Inhabitants of 385
Sidon 367
Silk-worm 262
How It Grows and Feeds 262
Silver 115
Simile 733
Simla 686
Simoon 93
In the Sahara . . . 100
Sirocco 93
Sisal 168
Skates 228
Sky, Colors of 102
Slavery, Rise of Issue in United States . . 640
Slavs 289, 290
Historical Outlines . . . . . 441 *et seq.*
Sloth 204
Smelt 227
Snails 229–230
Snakes 222
Snow 94
Height of Snow Line 97
Where Permanent Snow Exists . . . 96
Snow-crystals 94, 96
Socrates, Accusation and Death 379
Sodium 115
Sofia 552
Sorghum 127
Solar System . . 13 *et seq.*
Sole 227
Solomon 359, 360

INDEX

PAGE

Solon, Reforms and Laws of 375
Solstice 90
South America 672
Argentina 672
Brazil 674
Chile 676
Countries of 443
Mountains of 76
Sovereigns of England, Important Facts about . . . 472 *et seq.*
Table of . . . 472 *et seq.*
Sovereigns of France . 493
Spain 564
Cities 565
Escurial 566
Government 565
Historical Outlines . 410
History 566
Madrid 565
People 564
Production and Industry 564
Pyrenees and Spanish Peninsula 446
Surface 564
Under the Saracens . 406
Spanish Words and Phrases 742
Sparrows 215
Sparta 374
Growth and Importance of 376
Supremacy of 379
Training of Citizens . 374
Special Senses 933
Speech, Organs of . . . 712
Spelt 127
Sphinx, The . . . 342, 351
Spiders 231
Sponges 243
Spotted Hemlock . . . 169
Springs 69
Spruce 165
Square Measure . 857, 858
Practical Applications of 858
Squid 230
Squirrel 199
Flying 205
Standard Time 865
Stanzas 741
Starfish 241–242
Stars:
(See also Constellations.)
Chart of Southern Constellations . . 29
Grouping of 24
Magnitude of 24
Milky Way 32
Names of Important 34
Varied Colors of . . 34
State and Territorial Government . 650–651
Governors . . . 650–651
Legislatures . . 650–651
Members' Terms 650–651
Persons Excluded from Suffrage . 650–651
Previous Residence Required . . . 650–651
Requirements as to Citizenship . . 650–651
States and Territories of United States 588–590
States:
Admission of . . 588–590
Area and Population 588–590
Capital and Population 588–590
Chief Productions 588–590
Motto and Meaning 588–590
Origin and Meaning of Name . . . 588–590
Original Territory from Which Derived 588–590
Popular Name of 650–651

PAGE

States—Continued.
Where, When and by Whom Settled 588–590
Staubbach, Falls of . . 83
Statutes of Limitation . 875
Stockholm 568
Panorama of 568
Royal Theater . . . 569
Stoke Pogis 466
Stork 217–218
Storms 93
Stratford-on-Avon . 463–464
View of 465
Sturgeon 228
Suez 352
Suez Canal 352
Sugar-cane 127
Sulphur 115
Summer Solstice . . . 90
Sun:
Distribution of Heat 90
How It Sends out Its Rays 98
Life-giver of the Earth 98
Supreme Influence of 97
Sun-spots, Explanation of 17
Surveyors' Measure 857, 858
Susa 371
Swallows 215
Swans 219, 260
Sweden 567
Cities 567
Government of . . . 567
Historical Outlines . . . . . 401 *et seq.*
History 568
People 567
Production and Industry 567
Stockholm 568
Surface 567
Upsala 569
Swine 255, 256
Switzerland 570
Altdorf 570
Berne 571
Cities 571
Climate and Scenery . 570
Government 571
Historical Outlines . . . . . 415 *et seq.*
History of 572
People 571
Production and Industry 571
Rivers and Lakes . . 570
Surface 570
Sword-fish 227
Sycamore 165
Synecdoche 734
Syria 381
Antiochus the Great . 382
Damascus 364
Palmyra 366
Tadmor 366
The Seleucidæ . . . 381
Syrian Monarchy . . . 381

T

Tables:
American Literature 778–779
Campaigns and Battles of the American Revolution 636
English Literature 769–770
Identification of Minerals . 104, 105, 106, 107
Planting for Garden Vegetables 132, 133, 134, 135, 136
Sounds of Consonants 713
States and Territories 588–590
World's Greatest Explorers 310–311
Tadmor 366
Tahr 202
Taj Mahal 687
Talc 106

PAGE

Tapir 204
Tariff, Rise of Policy . 639
Tea 147
Tea Plant, Its Cultivation 146
Tell, William, Statue of 570
Temperate Zones:
Animal Life of . . . 121
Plant Life of 121
Temperature of Oceans 86
(See also under Climate and Temperature.)
Temples:
Of Janus 40
Of Petra 365, 366
Of Philæ 345
Tennyson, Place in English Literature . . 769
Terrapin 221
Teutons 291
Texas Land Measure . 858
Thames, The 456
Description of . 456, 457
Thebes 352
Thebes, Greece:
Destruction of . . . 380
Rise of 379
Thermopylæ, Battle of . 377
Thirty Years' War . . 696
Thorn Apple 169
Thrasher 216
Thrush 216
Tides 86
Effect of Moon on . 86
Height of 87
Tiger. 197
Tigris River 353
Time:
Calendar 866, 867
Measures of 865
On Shipboard . . . 868
Where the Day Begins 867
Timothy 127
Tin 115
Titles, Official, Clerical, Royal and Noble 737–738
Toad 224
Tobacco Plant 168
Tokio 689
Tomato 131
Topaz 112
Tornadoes 93
Tortoises 220
Toucan 212
Tours, Battle of . . . 406
Tower of Babel 354
Model of 355
Trade Winds 93
Treaties, Historical Outlines . . . . 411 *et seq.*
Trees of the Forest . . 160
Trees:
Bark, Cells, Heart, Sap and Rings . . 163
How They Grow . . 163
How to Know Them 161
Trojan War 692
Tropical Life 121
Tropics:
Animal Life of . . . 121
Plant Life in 121
Trout 227
Troy Weight 861
Tudors, The 467
Tulip 149
Turkey 220, 292
(See also Turks, Ottomans.)
Asiatic 572
Bagdad Railroad . . 577
Cities 574
Climate and Industry 573
Commerce 574
Constantinople . . . 574
Dardanelles Campaign 577
European 573
Government of . . . 574
History 576
People 574
Physical Features . . 573
Statistics about . . 572

PAGE

Turkeys 260
Breeds of 260
Turks, or Ottomans . . 292
Conquer Byzantine or Eastern Empire . . 404
Historical Outlines . . . . . 419 *et seq.*
Turnip 131
Turquoise 112
Turtles 220
Sea 221
Snapping 221
Tusk Shells 230
Typhoons 93
Tyre 367

U

Udo 129
United States 579
Center of Population 587
Cities 590
Climate and Irrigation 587
Coast of 581
Colorado River . . . 582
Congress of 656
Executive Departments of 654
Government . . 652–662
Great Central Plain . 580
Great Lakes 583
Great Salt Lake . . 583
Historical Outlines . . . . . 422 *et seq.*
Hudson River . . . 582
Islands 581
Judicial Department of 660
Lakes of 583
Legal Weights per Bushel . . 861, 862, 863
Money and Coins 868, 869
Mountains and Plains 580
Natural Wonders of . 584
Outlines of Colonial History . . . 628–633
Outlines of Period of Settlement 630, 631, 632, 633
Political Divisions . . 587
President, The . . . 652
Public Lands 587
Races Represented in 293
Rivers 581
St. Lawrence River . 582
Surface 579
Tables of States and Territories . . 558–590
Tables of the Presidents 662–665
United States History:
Adoption of Constitution 637
American Independence Declared . . 636
Articles of Confederation 637
Assassination of Lincoln 644
Assassination of McKinley and Succession of Roosevelt 647
Campaigns and Battles of the American Revolution 636
Civil War of 1861-1865 642
Continental Congress 635
Democrats Restored to Power under Leadership of Woodrow Wilson . 647
Early Troubles in Our System of Public Finance 639
Effect of French and English Struggles upon United States 637
Election of Hayes Decided by an Electoral Commission . 645
Era of the Whigs . . 640
Fall of the Federalists 639

PAGE
United States History —Continued.
How Europe First Divided the Colonies 635
Lincoln and Rise of Republican Party . 642
Map of Panama Canal and Connections 649
McKinley and the Spanish-American War 645
Mexican War and Annexation of Texas 640, 641
Norse Discoverers . . 634
Oppression of the Colonies under British Rule . . . 635
Panama Canal . . . 648
Period of Discovery . 634
Period of Discovery and Exploration. 628, 629
Period of Industrial Expansion 639
Period of Settlement 630–633
Preliminary Struggle over Slavery . 640, 641
Resumption of Specie Payments by the Government . . . 645
Revolution 635
Rise of "Protected Tariff" Policy . . 639
Rise of Slavery Issue 640
Secession of Southern States, and Formation of Confederacy 642
Settlement at Jamestown 634
Settlement of Carolinas 630–632
Settlement of Connecticut 630–632
Settlement of Delaware 631–633
Settlement of Georgia 632
Settlement of Maryland 630–632
Settlement of Massachusetts . . . 630–632
Settlement of New Hampshire . . 630–632
Settlement of New Jersey 631–633
Settlement of New York 631–633
Settlement of Pennsylvania 633
Settlement of Rhode Island 630–632
Settlement of Virginia 630–632
Spanish-American War 646
Struggle of England and France for America 635
Taft and the Rise of the Progressives . 647
War of 1812 638
Wilson Re-elected and His Policies Approved 648
Unter den Linden, Berlin 499
Upas Tree 165
Upsala 569
University of 569
Urals 446
Usury, Penalty for . . 875
Utah, Great Salt Lake 77

V

Valois, House of . . . 494
Vapor, Atmospheric . . 94
Vatican Palace 516
Vegetable Kingdom 119 *et seq.* (See also Plants and Plant Life.)
Botanical Classification of Plants . . . 182, 183, 184, 185, 186

PAGE
Vegetable Kingdom —Continued.
Chief Divisions of . . 122
Cryptogams 158
Fiber and Commercial Plants 166
Flowering Shrubs and Plants 155, 156
Flowers and Other Ornamental Plants 147
Forest Trees 160
Fruit-bearing Shrubs and Plants 142
Fruit Trees 136
Kitchen Vegetables . 128
Newest Grown Vegetables 129
Planting Tables . . . 132, 133, 134, 135, 136
Poisonous Plants . . 168
Scientific Terms in Botany 176
Wonders of Plant Life 169
Venice 523–524
Campanile and Palace 522
Vernal Equinox 90
Versailles 483
Verus' Fly-trap 169
Victorian Era 469
Victorian Period . 768–775
Vicuna 202
Vienna 529
Industries of 531
Noted Buildings 530–531
Vines:
Description of Desirable Annuals . 154, 155
Desirable Annuals 154, 155
Vladivostok 545
Voice, Inflection of . . 716
Volcanoes . . . 63 *et seq.*
Location and Height 65
Most Noted 65
Vowels 712
Vultures 211

W

Walnut 142
Walrus 205
Wanderoo 194
War of the Austrian Succession 696
War of 1812 638
War of Greek Independence 697
War of Italian Liberation 697
War of the Holy Roman Empire 695
War of the Spanish Succession 696
Warblers 216
Wars, Great, Historical Outlines . . 312 *et seq.*
Wars for Control of Italy 695
Wars of Alexander the Great 693
Wars of Constantine . . 694
Wars of the English Barons 695
Wars of Justinian . . . 694
Wars of Louis XIV. . . 696
Wars of the Roses . . . 695
Wars of Universal History 692–699
Warsaw 560
Washington, D. C. . . 623
Arlington House . . 626
Bureau of Engraving and Printing . . . 624
Capitol 623
Catholic University of America 626
Census Bureau . . . 625
Chief Shopping Streets 623
Churches and Educational Institutions of 626

PAGE
Washington, D. C.—Con.
Congressional Library 623–624
Continental Hall . . 625
Corcoran Art Gallery 624
Department of Agriculture 624
District or Municipal Building 625
Ford's Theater . . . 625
George Washington University 626
Georgetown University 626
Government Printing Office 625
History of 623
Interior Department . 625
International Bureau of American Republics 625
Judiciary Square and Pension Office . . 625
Mount Vernon . . . 627
National Military Cemetery (Arlington) 626
National Soldiers' Home 626
New National Museum 624
Notable Public Buildings 624–625
Notable Residence Streets 623–624
Parks, Squares and Circles 623–624
Post Office Department 625
St. John's Church 625–626
Smithsonian Institution 624
State, War and Navy Departments . . . 625
Treasury Department 624
Trinity College for Women 626
Union Railway Station 623
United States Naval Observatory . . . 626
Views of Washington's Home and Tomb, Mt. Vernon . . . 627
White House 625
Wasps 238, 240
Water:
Composition and Forms of 69
How Distributed over the Earth . 68 *et seq.*
Water Hemlock 169
Waterfalls, Famous . . 80
Bridal Veil 83
Iguazu 82
Juanacatlan 82
Niagara 82
Reichenbach 83
Schaffhausen 81
Staubbach 83
Yellowstone 83
Yosemite 83
Watermelon 131
Wealth, of Nations . . 443
Weather 89
Weevil 234
Weights and Measures:
Apothecaries' Liquid Measure 860
Apothecaries' Weight 863
Avoirdupois Weight . 860
Calendar 866, 867
Capacity 860
Circular Measures . . 864
Comparison of . . . 864
Cubic or Solid Measure 859
Dry Measure 860
Land Measure . . . 858
Legal Weights per Bushel . . 861, 862, 863
Length 857
Liquid Measures . . 860
Long Measures . . . 856
Longitude and Time . 864

PAGE
Weights and Measures —Continued.
Of the Philippines . . 870
Square Measure, 857, 858
Surface 857
Surveyor's Measure 857, 858
Texas Land Measure 858
Time Measures . . . 865
Troy Weight 861
United States Money 868, 869
Wellesley College . . . 594
Westminster Abbey . . 460
Whales 207
Wheat 128
Whitefish 228
Wild Flowers 157
Wild Goat 202
Willow 165
Winds 92
Hurricane 93
Simoon 93
Sirocco 93
Storms 93
Tornadoes 93
Trade Winds 93
Typhoons 93
Windsor 464, 466
Winter Solstice 90
Wire-worms 234
Wolf 197
Prairie 198
Wolf's-bane 169
Wonders of Plant Life 169
Woodcock 218
Woodpecker 212
Words:
Choice and Use of . . 717
From Modern Foreign Languages 742
Right and Wrong Use of 718, 724
World:
About B. C. 3800 to B. C. 450 . . 296–301
About B. C. 450 . . 301
About B. C. 325 . . 301
About 300 A. D. . . 301
About 500 A. D. 302–303
About 800 A. D. 302–303
About 1000 A. D. 302–303
About 1300 A. D. 302–303
About 1500 A. D. 304–305
About 1600 A. D. 304–305
About 1700 A. D. 306–307
About 1800 A. D. 306–307
About 1915 A. D. 308–309
Asia 677
Colonial Divisions of 690
Greatest Explorers of 310–311
Independent Countries of 443
North America . . . 578
Political Divisions of 443
Principal Languages of 442
Races and Population 442
Religious Population . 442
South America . . . 672
Wrens 216

X

Xerxes the Great . . . 370

Y

Yak 256
Yale University . . 605–606
Yam 131
Yellowstone Falls . . . 83
Yellowstone National Park 586
Yew Tree 165
Yokahama 689
Yosemite Falls 83
Yosemite Valley . . . 585

Z

Zama, Battle of 391
Zebra 203
Zebu 256
Zinc 115
Zwinger, The, Dresden 503

SUPPLEMENTARY INDEX

A PAGE

Acids 891–892
Aeroplanes 902
Airship, Modern . . . 903
  Zeppelins 903
Alcohol 892
Alimentary Canal, Diagram of 929
Alkali 892
Aluminum 883
Antimony 883
Argon 883
Arithmetic:
  Bank Discount . . . 873
  Chemical 882
  Exchange 874
  Interest 873
  Percentage and Its Business Applications 870
  Promissory Notes . . 872
  Square and Cube Root 878
  Taxes and Taxation . 877
Arsenic 883
Astronomy, Outlines for Grade Schools . . 897
Atomic Theory 881

B

Bank Discount 873
Barium 883
Berthollet's Law . . . 882
Biography
  Comparative and Chronological Tables
Bismuth 883
Boron 883
Botany, Outlines for Grade Schools . . 896
Brain 932
Bromine 884

C

Camium 884
Caesium 884
Calcium 884
Calomel 894
Carbon 884
Cerium 884
Chemical Elements:
  Compounds and Chief Uses . . . 883 *et seq.*
  Important Data Concerning . . 883 *et seq.*
  Occurrence, Preparation and Properties 883
  Table of . . . 883 *et seq.*
Chemicals, Common Names of 894
Chemistry 880
  Atomic Theory . . . 881
  Berthollet's Law . . 882
  Chemical Arithmetic 882
  Chemical Notation . 881
  Of Common Things . 891
  Importance and Divisions 880
  Laws of 881
  Molecular Weights . 881
  Nomenclature . . . 882
  Organic and Inorganic 880
  Outlines for Grade Schools 897

PAGE

Chemistry—Continued.
  Physical 881
  Radicals 882
  Reactions 881
  Table of Chemical Elements 883
  Theoretical 881
Chest or Thorax . . . 930
Child World . . 945 *et seq.*
  The Art of Story Telling 959–969
  The Bath 949
  Bones and Muscles . 948
  Children's Gardens . 954
  The Children of the Animals 957
  The Child's Food . . 947
  The Child's Lessons . 947
  Child's Picture Grammar 955
  Combinations of Numbers 971
  Counting 970
  The Days and Months 973
  Dutch Dolls and the "Alphabet Game" . 951
  Effect of Seasons on the Nervous System 948
  Form and Color 960–962
  The Growing Body . 945
  How to Teach a Child to Read at Home 952–954
  Money Taught as Numbers 971
  The Mother as Teacher 944
  Nature as the First Craftsman 958
  Nature's Best Doctors 946
  Primary Measures for Children 972
  Puberty and Its Problems 948, 987–989
  Rest and Sleep . 948–949
  The School Age . . . 945
  Stories, Illustrated 959–969
  Telling the Time 972–973
  Time for Work . . . 947
  Ventilation 949
  What Our Domestic Animals Give Us . 956
  "Where Did You Come From, Baby Dear?" 950
Chlorine 884
Chromium 884
Circulatory System . . 930
Cobalt 884
Columbium 884
Commercial Law, Promissory Notes . 872
Commission 871
Common Names of Chemicals 894
Compass, Mariner's . . 912
Copper 885
Cranium 932
Cube Root 878
Customs Taxes 878

D

Dynamos and Motors . 916
Dysprosium 588

E PAGE

Earth, Magnetic Poles of 912
Electric Cell, What Goes on Within 915
Electric Light 914
Electric Machines . . . 916
Electric Telegraph, Principle of . . . 916
Electric Traction . . . 916
Electricity 907–911
  Application of to Machines 916
  Batteries . . . 913–914
  Currents 909
  Dynamos and Motors 916
Electron Theory . 908–909
  How Produced . . . 908
  Lightning 909
  Natural Exhibitions of 909–911
  Theories About . . . 907
  Wireless Telegraphy . 918
Electro-Magnetism . . 916
Electrons 908
Electrotyping 916
Erbium 885
Ether 892
Europium 885
Exchange 874
  Domestic 875
  Principles of 876

F

Fermentation 892
Fluorine 885
French and Indian War, C32 635

G

Gadolinium 885
Gallium 885
Galvanic, or Voltaic Battery . . . 913, 914
Galvanism 913
Galvanometer 913
Gas Meter, How to Read 895
Gateways of Knowledge 933
Geology, Outlines for Grade Schools . . 897
Germanium 885
Glucinum 885
Gold 885

H

Heart 933
Heart and Its Coverings 930
Helium 885
Holmium 886
Human Body . 925 *et seq.*
  Alimentary Canal . . 929
  As a Machine . . . 927
  Centers of Control . 927
  Circulatory System . 930
  Divisions of 927
  Framework and Muscles of 926
  Health in Childhood . 961
  Heart and Its Coverings 930

PAGE

Human Body—Continued.
  How It Is Built . . 927
  Nervous System . . 932
  Organs of Chest . . 928
  Puberty and Its Problems . . 948, 987
  Respiratory System . 931
  Systems and Organs . . . . . 927 *et seq.*
Human Brain 933
Hydrogen 886

I

Indium 886
Interest 873
  Common Methods . 873
  Compound 874
  Table of Time . . . 874
Inventions, Great Mechanical . . . 898
Iodine 886
Iridium 886
Iron 886

K

Krypton 886

L

Lanthanum 886
Lead 886
Lightning, a Form of Electricity 909
Liquid Air 924
Lithium 886
Loadstone 911–912
Locomotive, Description and Types . . 901–902
  Electric 902
  Skeleton and Parts of 900
Lungs 931
Lutecium 887

M

Magnesium 887
Magnetism 911
  Magnetic Poles of the Earth 912
  Relation to Electricity . . . 911, 912, 913
Magnets 912, 913
Manganese 887
Mariner's Compass . . 912
Mercury 887
Meteorology, Outlines for Grade Schools . 897
Mineralogy, Outlines for Grade Schools . . 896
Molybdenum 887
Neon 887
Neo-dymium 887

N

Nervour System . . . 932
Nickel 887
Nightingale, Florence . 958

PAGE

Nitrogen 887
Notes:
Legal Rules Concerning 872
Promissory 872

O

Osmium 887
Oxygen 887

P

Palladium 888
Percentage and Its Business Applications 870
Bank Discount . . . 873
Commission 871
Exchange 874
Profit and Loss . . . 871
Promissory Notes . . 872
Stocks and Bonds . . 876
Taxes and Taxation . 877
Trade Discount . . . 871
Pericardium 930
Periscope, The 905
Phosphorus 888
Physics and Chemistry, Outlines for Grade Schools 897
Physiology . . . 925 *et seq.*
Platinum 888
Potassium 888
Praseodymium 888
Profit and Loss 871
Promissory Notes . . . 872
Puberty and Its Problems . . 948, 987-989

R

PAGE

Radium 888
Description of . . . 894
History and Properties 894-895
Medical Uses of . . 895
Red Cross, Woman Founder 958
Respiratory System . . 931
Rhodium 888
Röntgen, or X-rays 921-923
Rubidium 888
Ruthenium 888

S

Samarium 889
Scandium 889
Science, Outline Course of Elementary 896-897
Science Outlines for Schools . . . 896-897
Selenium 889
Silicon 889
Silver 889
Sodium 889
Special Senses:
Hearing 933-935
Seeing 936-938
Smelling 940-941
Taste . . . 939, 940, 941
Touch 941-942
Organs of:
Ear 933-935
Eye 936-938
Hand 941-942
Nose 940-941
Tongue . 939, 940, 941
Spinal Cord 932
Spinthariscope 895
Square Root 878

PAGE

Starch 891
Steam Engines 898
Stocks and Bonds . . . 876
Strontium 889
Submarines 904
How Equipped . . . 906
Marvelous Mechanism 904
The Periscope . . . 905
Torpedo Tube . . . 906
Sulphur 889
Sympathetic System . 932

T

Tables, Interest . . . 874
Tantalum 890
Taxes and Taxation . . 877
Taxes:
Customs 878
Table of Tax Values . 878
Teeth and Their Names 933
Teeth, Permanent . . 933
Telegraph, Electric, Principle of . . . 916
Tellurium 890
Terbium 890
Thallium 890
Thorax 930
Thorium 890
Thullium 890
Tin 890
Titanium 890
Torpedoes, How Launched by a Submarine 906
Trade Discount 871
Tungsten 890
Turbines, Steam . . . 899

U

PAGE

Uranium 890

V

Vanadium 890
Vocal Cords 931
Voice, Organ of 933

W

Wireless Telegraphy 917, 918, 919
Wireless Telephony . . 920
World War . . . 698, 943

X

Xenon 891
X-rays 921-923

Y

Yeast 892
Ytterbium 891
Yttrium 891

Z

Zeppelins 903
Zinc 891
Zirconium 891
Zoology, Outlines for Grade Schools . . 896